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A Pilot Study of a Behavioral Parent Training in the Republic of Macedonia

Blake D. Hansen¹  · Emma Lucy Orton¹ · Chase Adams¹ · Laura Knecht¹ · Sophie Rindlisbaker¹ · Filip Juratoski² · Vladimir Trajkovski²

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Abstract Parenting children with autism in countries with limited professional and financial resources can be overwhelming. Parent training led by non-governmental organizations may help alleviate some of these burdens. The present pilot study was conducted in the Republic of Macedonia, a country located in Southeastern Europe. The purpose of the study was to evaluate a parent training model for disseminating evidence-based practices through didactic and pyramidal training strategies. Results indicated that children improved on a number of different behaviors and results provide some evidence that parenting confidence and distress improved.

Keywords Behavioral parent training · International settings · Behavior analysis

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and excesses in restricted, repetitive behaviors (American Psychiatric Association 2013). Parents who provide care for these children tend to experience a variety of problems including employment issues (Baker and Drapela 2010; Cidav et al. 2012; Gray 2009), financial constraints

(Cidav et al. 2012; Knapp et al. 2009), stress (Dunn et al. 2001; Hayes and Watson 2013), marital stress (Rivers and Stoneman 2003), and depression (Singer and Floyd 2006). In countries that have fewer disability professionals and more economic and political challenges, these problems are amplified (Dyches et al. 2004; Lotter 1978; Mendoza 2010).

Western Europe and North America have government programs and non-profit organizations to support parents who have children with disabilities by making available a wide range of resources, including comprehensive diagnostic capabilities, specialized medical care, occupational therapy, speech therapy, physical therapy, educational interventions, employment assistance, and social programs that support the quality of life for individuals with disabilities and their families. But in economically developing countries, these services are less concentrated, and families bear the burden of caring for their children with fewer supports (Emerson 2007).

The Republic of Macedonia is an economically developing country located in southeastern Europe, whose long and arduous process of transition over the last several years has had profound effects on its population, especially among minority groups and persons with disabilities (Trajkovski 2008). Although the country has a population of more than two million, it is immensely ethnically diverse, with four major language groups (Macedonian, Albanian, Turkic, and Romani). The Macedonian constitution does guarantee access to health care to its citizens, but local health care providers are not adequately equipped to serve individuals with disabilities. Among other issues, neonatal screening for genetic disorders is limited, the nation lacks a centralized database on disabilities, and the quality of health care in urban centers does not extend to rural areas (Trajkovski 2010, 2015).

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In addition to this deficit in adequate health care, families of children with disabilities in Macedonia face a number of related challenges. They are viewed negatively by society and professionals, treatment staff are not always up to date on the latest treatment methods, services are under resourced and under equipped to handle families' unique needs, and community resources are too limited to adequately serve families who have children with disabilities (Ajdinski and Florian 1997). Macedonia also has a history of reporting fewer cases of ASD than can reasonably be assumed to exist nationally, indicating the probable existence of cultural biases or other errors in diagnosis (Trajkovski et al. 2005). In spite of these barriers, professionals in Macedonia have a vested interest in serving individuals with disabilities and would benefit from additional supports (Ajdinski 2004). In short, families of children with disabilities in Macedonia face challenges both on a cultural and a practical level that they are unequipped to handle with the tools and support systems available to them. The following study suggests a culturally appropriate and economically viable method for providing additional support to families who need it.

The study utilizes behavioral parent training, which researchers have used to great effect to overcome social barriers for families of children with autism and related developmental disorders (Johnson et al. 2013; Maughan et al. 2005; Schreibman et al. 1991). This method involves training parents (a) to use operant procedures to prompt and reinforce and (b) to use antecedent control strategies to promote socially important behaviors (Graziano and Diamant 1992; Van Camp et al. 2008). Parent training is different than parent education. While parent training is typically direct, with clear and measured outcomes, parent education in autism usually involves teaching parents about the disorder itself and about interventions. A recent randomized clinical trial demonstrated stronger effects with the utilization of parent training methods than with parent education (Bearss et al. 2015).

Parent training places important tools for the success of children with disabilities directly into the hands of the parents of those children, who have the most vested interest in improving quality of life for their families, and who interact with their children more frequently and in a greater variety of settings than service providers do. In countries like Macedonia that have shortages in financial and therapeutic resources, parent training can help support parents without placing undue burdens on the institutions that support individuals with disabilities. The deficits in disability support in Macedonia include a dearth in reach within such institutions, leading to accompanying difficulty associated with disseminating training such as parent training as described above. This study proposes

synthesizing parent training with a pyramidal training model to combat those challenges of accessibility.

Pyramidal training is an effective model for disseminating interventions and building capacity in parents (Kuhn et al. 2003; Loughrey et al. 2014; Neef 1995). In pyramidal training, a therapist trains a non-professional, and that person trains others. Although studies have shown that parents in other regions of the world can train each other to implement interventions (McConkey et al. 2000), studies that measure the effectiveness of these interventions have not yet been evaluated in Southeastern Europe. This pilot study evaluates the feasibility of a brief parent training in Skopje, Macedonia. The paradigm of the training was behavioral, focused on training parents on basic foundations and principles (i.e., function of behavior) and on three specific intervention strategies related to the social and behavioral challenges frequently faced by children with autism: (a) providing differential reinforcement for compliance, (b) teaching eye contact, and (c) redirecting repetitive behaviors. Assessments for a variety of parent and child attitudes and behaviors were conducted both one month before and one month after the training. Training was provided in two formats: didactic training, where training was provided to groups of individuals by a therapist, and pyramidal training, where parents trained each other on the three intervention strategies referenced above. The study addressed the following questions.

1. To what extent do Macedonian parents acquire skills during training?
2. Can parents train other parents with fidelity?
3. What are the effects of parent training on child behavior?
4. What is the role of parent self-efficacy in parent training in Macedonia?
5. To what extent are Macedonian parents satisfied with the parent training goals, outcomes, and methods?

Method

Participants

Participants were notified about the study via social media, telephone, and email using the contact lists of the Macedonian Scientific Society for Autism. Those who elected to participate attended a meeting on a university campus one month prior to the training. A total of 20 parents initially enrolled in the study (including two married couples)—parents of 18 children with autism and related disorders. One parent withdrew from the study before the follow-up due to chronic illness, and one did not complete posttesting. Another parent did not complete the pretesting; thus the

study did not have enough measures to evaluate the effects of the training for that participant. In all, 17 parents completed the training and returned questionnaires for their 15 children. Only one parent from each married couple submitted assessments for their children, but both completed the training. Of those who completed the training component of the study, 11 were mothers (mean age = 40.6) and 6 were fathers (mean age = 41.1). Four parents were divorced and serving as primary caregivers to their children.

Children in the study, 12 (80%) of whom were males and 3 (20%) of whom were females, average age of 8.7 (range 4–12). When asked about services received by their children, parents reported that their children received special education services at public schools which provided speech services, physical therapy, and educational programming appropriate for children with developmental disabilities. As in other countries, public schools in Macedonia serve all children with disabilities, but schools for children with disabilities are typically self-contained.

All children had autism diagnoses which were given by pediatricians, psychiatrists, or clinical psychologists according to DSM-V and ICD-10 criteria. Six (40.0%) were reported to have an intellectual disability also, and five (33.3%) were diagnosed with other comorbidities: one child had tuberous sclerosis (6.7%), two had epilepsy (13.3%), one had attention deficit hyperactivity disorder (6.7%), one had unspecified encephalopathy (6.7%), and one had dermatomyositis (6.7%). All participants were ethnic Macedonians. One of these participants spoke English as her first language, having been raised in an English-speaking country; she received printed materials in English because her proficiency in that language was higher. All participants were from Skopje or two nearby cities of at least 100,000 people. Five parents had completed high school, one had completed some college/university, eight parents had completed a bachelor's degree, two parents had completed dental or medical school, and one parent did not specify.

The training portion of the study was conducted with three groups of approximately six parents each. Trainings were held over three consecutive days with a different group each of the 3 days. The pyramidal model was used within each group, with participants training others who attended the training on the same day. Six parents brought their children to the training meetings, but the study procedures remained the same with all parents regardless of the presence or absence of their children.

Setting

The study was conducted in Skopje, the capital of Macedonia, which has a population of approximately 700,000. Trainings took place in a large room of approximately 1500 square feet, and assessments were conducted in separate

rooms to minimize interference. Tables were set up in far corners of the training room with participants' backs to each other so as to facilitate training interactions without interference from the other training sessions occurring simultaneously.

Measures

Assessments were carried out over the course of 2 months at three major time points: 1 month prior to training, on the training day, and 1 month following training. Several tests were completed at each of the time points mentioned, and skill acquisition was sampled immediately prior to and following training.

Skill Acquisition

The primary method of observing skill acquisition during the training sessions was a simulation in which a therapist played the role of a child and the participant played the role of the parent. Each of the three simulations described below was conducted three times for each participant: before the training was given, as part of the training, and after the training was complete. The first simulation was linked to praising compliance. The parent was prompted to ask the therapist (who was acting as a child) to pick up an item from the floor. Each parent's performance during this simulation was rated based on the task analysis for his or her use of verbal praise following compliance. The second simulation was linked to prompting eye contact. The therapist played the role of a child making a request for an item. The parent was rated on his or her ability to withhold the item until the child responded to a prompt to give eye contact. The third simulation was linked to redirecting repetitive behaviors. The therapist played the role of a child engaging in a mild stereotypic hand movement. The parent was evaluated on his or her ability to redirect the behavior and praise the child for engaging in the new behavior.

Parent behaviors during the simulations before training, at performance during training, and during a simulation after training were observed directly and evaluated on a task analysis form which indicated whether or not parents completed each predetermined step of the task analysis for that particular intervention skill. In addition to this measure of completion, a quality rating on a 5-point Likert scale was used to measure the degree to which parents met expectations for each step of the task analysis: 1 indicated *low quality* and 5 indicated *high quality*. The data set for skill acquisition included both spouses in the case of married couples, even though only one spouse from each couple completed the questionnaire measures at the three time points. Observers were two undergraduate students who had Macedonian language proficiency as a second

language. Training was provided by the first author during a 1-h training session that included reviewing the definitions and coding video. Once observers reached a minimum of 90% agreement with the first author, they were allowed to code independently. Videos of all simulations were used for coding interobserver agreement.

Child Behavior

Two measures were used to evaluate the effects of the training on child behavior. The *Strengths and Difficulties Questionnaire* (SDQ) parent report (Goodman 2001), Macedonian language version, was used at the three major time points (i.e., a month prior to training, at training, and a month after training). The SDQ has satisfactory internal consistency (Cronbach's $\alpha=0.73$), cross-informant correlation (mean=0.34), and test-retest reliability (mean=0.62; Goodman 2001). Items from the SDQ have been used extensively throughout Europe and in Macedonia (Pope et al. 2015) and with individuals with autism (Iizuka et al. 2010). To obtain a time series of the behaviors that were targeted specifically for the parent training, the parents completed a daily behavior rating (DBR) similar to *Direct Behavior Ratings* (Riley-Tillman et al. 2008) both 10 days before and 10 days after training. Using a ten-point scale ranging from 1 (*never*) to 10 (*always*), the parents rated the frequency of their children's demonstration of three skills in the natural environment: compliance, eye contact, and repetitive behaviors. Compliance and eye contact were targeted for increase, while repetitive behaviors were targeted for decrease.

Parent Self-Efficacy and Action

Parent self-efficacy was evaluated throughout the study with the 15-item scale of the *Parent Self-Efficacy in the Management of Asperger Syndrome* (PSE; Sofronoff and Farbotko 2002). The PSE measure was translated into Macedonian and back translated into English with permission of the measure's author. The PSE lists behaviors (e.g., child has become agitated or distressed by certain sounds, child follows routines rigidly), then asks if each behavior has occurred in the past month and has parents rate their confidence in responding to the given behavior on a 0–5 scale (0 = *none*, 5 = *completely confident*). The PSE is a relevant measure that has been used as an outcome measure in several parent training studies (Grahame et al. 2015; Sofronoff and Farbotko 2002). The PSE was conducted 1 month prior to training, on the training day, and 1 month after training. In addition to the PSE, parents completed a daily self-rating (DSR) over 10 days prior to the training and 10 days following the training. For the DSR, parents recorded their actions in addressing the targeted behaviors of compliance,

eye contact, and repetitive behaviors, along with their confidence in addressing those behaviors on a 1–10 (1 = *never*, 10 = *always*) scale.

Family Distress

To evaluate family distress, parents also completed the *Brief Family Distress Scale* (BFDS; Weiss and Lunsky 2011) 1 month prior to training, on the training day, and 1 month following training. This single-item questionnaire prompts parents to rate "where you and your family currently are right now in terms of crisis" by circling one item out of ten (e.g., 1 = *everything is fine, my family and I are not in crisis at all* to 10 = *we are currently in crisis, and it could not get any worse*). The BFDS positively correlates with a variety of known stressors (e.g., child behavior and negative life events) and caregiver problems (e.g., worry and mental health problems; Weiss and Lunsky 2011). With permission from the measure's author, the BFDS was translated into Macedonian and back-translated for use within this study.

Training Methods

Didactic Training

One month prior to the study, parents met with the investigators to discuss the study, provide consent, and discuss several specific needs. The training was led by the first author who held a PhD in behavior analysis. Trainings and printed materials were translated by a graduate student in special education and rehabilitation. During the first didactic training, parents were introduced to the concepts of behavioral intervention and positive reinforcement, and family needs were discussed. Parents were also provided the baseline measures (including the BFDS, SDQ, DBR, DSR, and PSE) and were taught how to complete them. The first didactic training lasted 1 h. Parents did not bring their children with them to this meeting. During the second didactic training, parents were taught about behavioral function and ways to respond to it. The differences between socially mediated (e.g., attention, escape, and tangible) functions of behavior and automatic reinforced behavior (e.g., automatic positive reinforcement and automatic negative reinforcement) were provided with examples of each. The discussion on function during this second training included information about how a single behavior could have a combination of functions or a single function and explained that topographies of behavior do not determine the function. Strategies for increasing compliance such as using tokens to reinforce compliance (Wadsworth et al. 2015) and implementing the high probability response sequence (Mace et al. 1988) were outlined and antecedent

strategies including picture schedules (Krantz et al. 1993) were taught. Participants completed a form that prompted them to describe their child's problem behaviors, suggest the possible function of the behaviors, and designate the resources available to support them in any effort. During this second training, investigators were available to answer specific questions about child behavior. The second didactic training lasted 30 min, and children did not participate.

Pyramidal Training

Directly following the second didactic training, pyramidal training procedures were used to teach three parenting skills based on the needs discussed in the first didactic session. The pyramidal training involved parents modeling and practicing skills with limited support from a therapist. The purpose was to evaluate this component of the training as a means for disseminating evidence-based practices among groups of parents, while maintaining fidelity (Neef 1995). Investigators utilized a behavior skills training approach that included a rationale for the skill, steps for performing the skill, a model of the skill, role plays of scenarios involving the skill, and scripted feedback on the participant's performance of the skill. Parents selected to train additional participants were provided with training scripts that they could read with those they trained. The parent trainer read the rationale and steps with the parent trainee and then modeled the skill with the parent in a role play. Then the trainee practiced the skill with the parent trainer, who provided feedback on whether or not the trainee completed the task correctly. Pyramidal trainings lasted approximately 30 min per person. After one parent was trained, he or she trained another parent. There were three levels of training in the present study (i.e., a therapist trained Parent 1 at Level 1, Parent 1 trained Parent 2 at Level 2, Parent 2 trained Parent 3 at Level 3).

The first skill was *praising compliance*, a skill selected because during the first didactic training many parents had expressed concern about their children's lack of compliance. Several options in addition to praise were described in materials from the second didactic training. The second skill targeted was teaching the child the practice of *making eye contact* while making a request (Carbone et al. 2013). This skill was chosen because eye contact is important for academic and social engagement. Teaching eye contact in the context of communication and play is frequently a component of comprehensive interventions (Green et al. 2002; Vismara and Rogers 2008). The third skill taught was *using response interruption and redirection* (Ahearn et al. 2007; Ahrens et al. 2011). This skill was chosen because the majority of children whose parents participated in this study showed either motor or vocal stereotypy, and while there are extensive studies on this intervention in western

countries, developing countries such as Macedonia have not been represented in those studies.

Follow Up

At the second didactic meeting, all parents were provided contact information for the investigators and invited to ask individual questions about their child. The reason for this was that the combined didactic trainings and pyramidal training may not have resolved specific needs for parents. In addition, the didactic training provided a foundation in functional assessment by which answers were provided. During the month following the trainings, the investigators were approached by 20% of the parents with specific questions related to the training. In addition, parents were encouraged to interact with each other and with others not involved with the training (e.g., spouses, other caretakers, and other parents of children with disabilities). The objective was to prompt parents to interact with as many people as possible to expand their own social networks and seek support when needed.

Social Validation

After the training, parents completed a nine-item social validity questionnaire. Parents rated each item by marking the box that indicated their level of agreement with the statement on a 5-point scale (1 *disagree*, 2 *somewhat disagree*, 3 *neutral*, 4 *somewhat agree*, 5 *agree*). The purpose of this questionnaire was to evaluate participants' perspectives on the intervention targets, the training method, and the alignment of the training with their cultural values. In addition, a question was included about trust in the trainer and another about parents' willingness to train others in their own homes.

Interobserver Agreement

A second observer independently coded 23.5% of the acquisition observations including the skill steps and quality ratings. The sessions were selected at random for interobserver agreement (IOA) coding. Percentage of agreement was calculated by dividing the lowest score by the highest score and multiplying the result by 100. Agreement for skill steps was 87.5% (range 75–100%) and for quality ratings was 91.7% (range 83.3–100%). Two raters completed 20% of the DBRs; again, IOA was calculated by dividing the lowest score by the highest score and multiplying the result by 100 yielding a percentage of agreement for each assessment. Mean IOA for compliance was 85.9% (range 42.8–100%), for eye contact was 93.6% (range 62.5–100%), and for repetitive behavior was 87.7% (range 40–100%).

Data Analysis

As multiple data sources were used for this study, different analyses were conducted. Skill acquisition was evaluated using a combination of visual analysis at the single participant level and paired sample *t* tests for aggregated group data. The SDQ was evaluated between the two pretests and between the pretest and posttest using a χ^2 on the categorical variables. DBR data were analyzed using descriptive statistics for single participants, and data were aggregated and analyzed using simulation modeling analysis (SMA; Borckardt et al. 2008), a bootstrapping method for time series data that yields an effect size and *p* value. PSE was analyzed using *t* tests between the first and second pretests and between the second pretest and the posttest. This method was chosen because categorical variables were not available for the PSE. Parents' DSRs were analyzed for confidence and action using SMA similar to the DBR for the child behaviors, and the BFDS was analyzed using χ^2 on the measure's categorical variables similar to the SDQ (between pretests and between the second pretest and posttest).

Results

Skill Acquisition

The present study included two measures of acquisition: the parents' acquisition of the steps of each task analysis (see Fig. 1) and the quality of mastery for each step (see Fig. 2).

Skill Steps

Pretesting of each skill demonstrated that the majority of parents could implement some of the steps before the

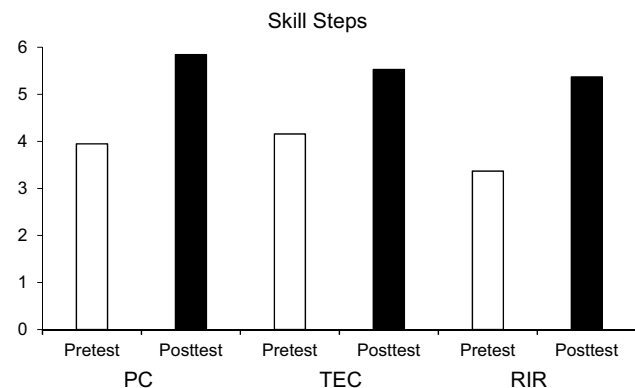


Fig. 1 Parent acquisition of skill steps. PC praising compliance, TEC teaching eye contact, RIR response interruption and redirection

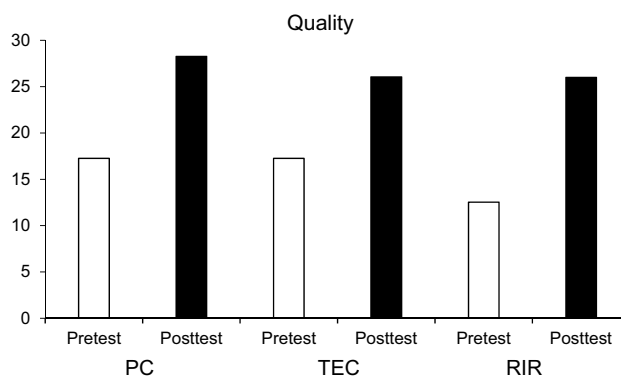


Fig. 2 Parent quality of acquisition. PC praising compliance, TEC teaching eye contact, RIR response interruption and redirection

training. The mean number of steps completed for giving contingent praise for compliance was 3.9 (*SD*=1.6), for teaching eye contact the mean was 4.2 (*SD*=1.7), and for implementing RIR the mean was 3.4 (*SD*=1.2). After the training, parents demonstrated the skills with an average of 5.8 (*SD*=0.7), $t(16) = -6.09$, $p < 0.001$ for contingent praise. Similar increases were observed for eye contact ($M=5.5$, $SD=1.3$), $t(16) = -3.63$, $p < 0.002$ and RIR ($M=5.4$, $SD=0.9$), $t(16) = -6.83$, $p < 0.001$.

Quality

In addition to rating the number of steps completed, observers also noted the quality of each step on a Likert-type scale ranging from 1 (*low quality*) to 5 (*high quality*).

During pretesting, parents demonstrated the delivery of contingent praise at a mean level of 17.3 (*SD*=7.5), prompting eye contact at 17.3 (*SD*=7.5) and implementing RIR at 12.5 (*SD*=4.8). Following the training, parents demonstrated the delivery of contingent praise at 28.3 (*SD*=3.6), $t(16) = -7.36$, $p < 0.001$; prompting eye contact at 26.1 (*SD*=6.8), $t(16) = -4.29$, $p < 0.001$ for EEC; and implementing RIR at 26.0 (*SD*=5.0), $t(16) = -8.97$, $p < 0.001$.

Training Fidelity

Fidelity was measured for each training session. Training involved six steps including providing the skill sheets, reading the rationale and steps, providing modeling, guided practice, and independent practice for the trainee. Results indicated that an average of 85% (range 38–100%) of steps were completed across all sessions.

The impact of training by a therapist versus the impact of training by another parent was evaluated by calculating the mean number of skill steps required at each of three levels, Level 1 referring to parents trained by a

therapist and Levels 2 and 3 referring to parents trained by other parents. Each skill had six steps (see Table 1). For praise, parents who were trained by a therapist (i.e., Level 1) acquired the skills on the average of 6.0, parents at Level 2 acquired the skill on the average of 6.0 steps, and parents trained at Level 3 acquired praise at 5.5 steps. For teaching eye contact, parents at Level 1 acquired the skill on average of 5.7 steps, parents at Level 2 acquired the skill on the average of 6.0 steps, and parents at Level 3 acquired the skill on the average of 4.83 steps. For RIR, parents at Level 1 acquired the skill at 5.7 steps, parents at Level 2 acquired the skill at 5.0 steps, and parents at Level 3 acquired the skill at 5.5 steps.

Child Behavior

The SDQ results are shown on Fig. 3. Table 2 includes the means and standard deviations of the SDQ at each time point.

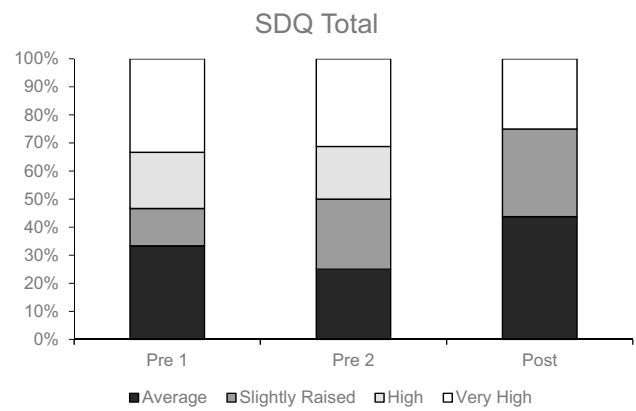


Fig. 3 Strengths and difficulties questionnaire (SDQ) categorical scores. The percentage of participants in each category (average, slightly raised, high, or high very) are plotted

SDQ

At the first and second pretests, 34% ($n=5$) and 27% ($n=4$) (respectively) of parents rated their children in the close to average range on the *Total Problems Subscale* of

Table 1 Skill steps

Praising compliance (PC)

Definition: when a child follows a parent directive within 10 s, the parent says a positive statement using an enthusiastic tone of voice and pleasant facial expression

1. Parent looks at experimenter
2. Parent waits 10 s for compliance
3. Parent provides a directive
4. Parent says a positive statement with
 - (a) an enthusiastic tone of voice
 - (b) and a pleasant facial expression

Teaching eye contact (TEC)

Definition: When the child makes a request without providing eye contact, the parent utilizes a prompting procedure to evoke the child's eye contact

1. When the child does not provide eye contact when making a request
2. Parent waits 5 s for eye contact
3. Parent prompts eye contact
4. Item is presented contingent upon eye contact
5. Parent praises eye contact
6. Parent makes eye contact with the child

Response interruption and redirection (RIR)

Definition: When the child engages in stereotypic behaviors, the parent directs the child to a competing motor task. The parent uses a prompting procedure to teach the child the motor task

1. When the child engages in motor stereotypy
2. Parent provides a verbal direction to a motor task
3. Parent models the motor task
4. Parent provides a verbal prompt to engage in the motor task
5. Parent provides a physical prompt to engage in the motor task
6. Parent provides praise contingent on engagement in the motor task

Table 2 Descriptive statistics for measures taken at three time points

| | Pretest 1 M (SD) | Pretest 2 M (SD) | Posttest M (SD) |
|------|------------------|------------------|-----------------|
| SDQ | 15.06 (7.21) | 16.61 (4.15) | 13.17 (7.16) |
| PSE | 3.82 (0.55) | 3.66 (0.75) | 3.84 (0.69) |
| BFDS | 4.38 (2.42) | 4.59 (2.44) | 4.31 (2.30) |

SDQ strengths and difficulties questionnaire, PSE parent self-efficacy, BFDS brief family distress scale

the SDQ. Following training, 47% ($n=7$) of parents rated their children in the *average* range on the same measure. During the two pretests prior to training, there were no significant differences between the number of children in the *average* range on the *Total Problems* subscale of the SDQ ($\chi^2=1.95$, $p=0.16$). Following training a significantly higher percentage of children were in the *average* range on the *Total Problems* subscale of the SDQ ($\chi^2=7.99$, $p<0.01$).

DBR

DBRs were collected 10 days prior to and 10 days following the trainings for *compliance* (the percentage of the opportunities that children followed adult directions within 10 s), *eye contact* (the percentage of interactions in which children used eye contact), and *repetitive behaviors* (the percentage of time the child engaged in repetitive behaviors). For *compliance*, 80% ($n=12$) of the children had positive trends throughout the study, 6% ($n=1$) had a neutral trend, and 13% ($n=2$) had negative trends. For *eye contact*, 80% ($n=12$) of the children had positive trends throughout the study, 6% ($n=1$) had a neutral trend, and 13% ($n=2$) had negative trends. For *repetitive behaviors*, 66% ($n=10$) had decreasing trends, 13% ($n=2$) had neutral trends, and 20% ($n=3$) had increasing trends.

Improvement on at least one behavior was shown for 86.7% ($n=13$) of the children throughout the course of the study. A total of 53.3% ($n=8$) improved all three behaviors, 26.7% ($n=3$) improved on two behaviors, and 6.7% ($n=1$) improved one behavior. One of the children who did not improve had higher functioning autism, and his parents reported that he had good eye contact and did not show stereotypic behaviors very often. The other participant who did not improve had limited verbal skills and intellectual disability and was reported to show compliance eye contact at relatively high rates, and stereotypic behaviors at relatively low rates. Group aggregated scores were subjected to simulation modeling analysis (SMA); effect size analysis showed strong effects for *compliance* ($r=0.83$, $p<0.01$), *eye contact* ($r=0.79$, $p<0.05$), and *repetitive behaviors* ($r=-0.76$, $p<0.05$).

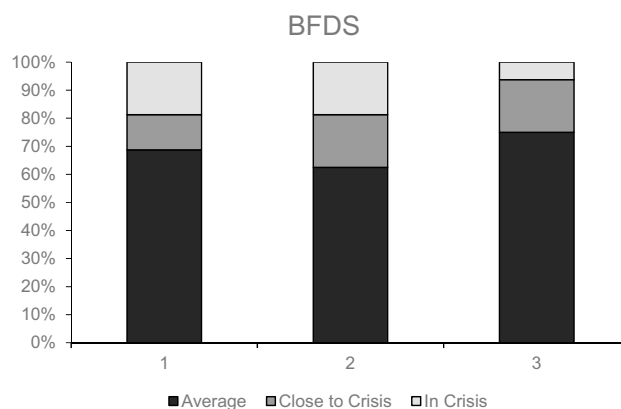


Fig. 4 Brief family distress scale results. The percentage of participants in each category (average, close to crisis, in crisis) are plotted

Parent Self-Efficacy and Action, and Family Distress

The PSE and the BFDS means and standard deviations are included on Table 2 for each of the three time points at which they were conducted. Figure 4 shows the percentage of participants graphed in each category for the BFDS.

PSE

At the first pretest parents rated their confidence in managing repetitive behaviors at 36.8 ($SD=13.9$). This rating decreased to 35.8 ($SD=14.3$) by the second pretest. One month following the training, parents rated their confidence at 38.7 ($SD=14.3$). Nine parents (60%) improved on this measure over one of the pretest scores. Four parents (26.7%) did not improve or worsen on this measure, while two parents (13.3%) worsened. Although confidence increased, the improvement was not significant at the $p<0.05$ level.

DSR

Daily self-ratings (DSR) were collected ten days prior to and ten days following the trainings for *confidence* (parents' self-reported confidence dealing with their child's behaviors) and *action* (parents' self-reported action taken to deal with their child's behaviors). *Confidence* ratings on the DSR mirrored those on the PSE: Nine parents showed increasing trends (60%), four parents (26.7%) showed neutral trends, and two parents (13.3%) showed decreasing trends. For *action*, eight parents (53.3%) showed increasing trends, two parents (13.3%) showed neutral trends, and five parents (33.3%) showed decreasing trends. SMA effect size estimates on the aggregated group showed significant changes for *confidence* ($r=0.84$, $p<0.01$) and *action* ($r=0.88$, $p<0.01$).

Family Distress

Parents used the BFDS to indicate family distress levels twice before the training and once following it. Means and standard deviations on the BFDS are shown on Table 2. During the first pretest, 66.6% ($n=10$) parents scored in the average range. At the second pretest, 60% ($n=9$) scored in the average range. A month after the training, 75% ($n=11$) scored in the average range. Between the two pretests there was an insignificant difference between the percentages ($\chi^2=0.8$, $p=0.37$). Between the second pretest and the posttest, the percentage of parents in the average range increased significantly ($\chi^2=3.62$, $p<0.05$).

Social Validity

Table 3 shows the social validity results aggregated for all participants. Parents rated each item by marking the box that indicated their level of agreement with the statement on a 5-point scale (1 *disagree*, 2 *somewhat disagree*, 3 *neutral*, 4 *somewhat agree*, 5 *agree*). Overall, eight out of nine of the items averaged 4 (*agree*) or better. The highest scoring item was Item 2, “Praising behavior is an effective way to increase behavior,” averaging a 5.0, which is the highest possible degree of agreement with the statement. The lowest scoring item was Item 7, “Having a fellow parent teach me skills aligns with my values,” which averaged 3.9. A total of 33.3% ($n=5$) of parents in the final sample reported that they trained other parents and caregivers of children with autism after the study.

Discussion

Since it emerged as an independent nation in 1991, the Republic of Macedonia has faced economic and social challenges that have seriously affected marginalized groups including persons with disabilities (Trajkovski 2008). Prior studies in Macedonia indicate that relatively little neonatal screening occurs, and that primary and secondary health

care options are limited for individuals with disabilities. Home-based interventions and other social services such as those widely available in regions such as Western Europe and the United States are relatively limited in Macedonia (Trajkovski 2010). The method presented in this study presents a possible model for disseminating services among Macedonian parents of children with disabilities.

The primary purpose of the present study was to evaluate the feasibility of a brief behavioral parent training model in Macedonia. Although the study did not present a comprehensive parent training, several improvements were noted. The study demonstrated that parents can train other parents and noted improvements in child behaviors following the pyramidal training where parents trained each other. It also demonstrated some improvements in parent self-efficacy and action and some decreases in family distress when this method of skill dissemination is used. In addition, parents saw the goal and methods training as important and socially valid, indicating that they see this training option as culturally appropriate for the region.

Parents in this study demonstrated acquisition of the skills that were included in the training during the simulations. All parents demonstrated acquisition in terms of task analysis steps completed and quality for at least one measure. An important component of this finding was that parents successfully acquired the skills when they were trained by other parents in the pyramidal training portion of the study instead of by a therapist. In addition, training by a therapist may have influenced training effectiveness, but in some cases (teaching eye contact, and RIR) parents at Level 3 performed better than parents at Level 2, indicating that when parents are trained by other parents, acquisition can be the same for discrete skills regardless of who performed the training. The implications for this are important, since this study demonstrated that evidence-based interventions could be disseminated through social networks of parents. This study adds to existing literature in this regard, extending it by providing additional evidence that in countries with socioeconomic challenges, parents can cooperate to provide support and training to each other despite the lack

Table 3 Social validity results

| | |
|---|------------------|
| 1. Providing eye contact is an important skill for children | 4.5 ^a |
| 2. Praising good behavior is an effective way to increase good behavior | 5.0 |
| 3. It is important to decrease repetitive behaviors in children with disabilities | 4.3 |
| 4. I trust the person who taught me the skills | 4.3 |
| 5. I would be willing to teach the skills to other people in their homes | 4.4 |
| 6. I would allow somebody to come to my house to show me how to help my child's behaviors | 4.4 |
| 7. Having a fellow parent teach me skills aligns with my values | 3.9 |
| 8. Allowing a fellow parent into my home fits my definition of hospitality | 4.3 |
| 9. I will use these skills in the future | 4.5 |

^aAggregated mean based on 5-point Likert type scale: 1 *strongly disagree*, 2 *disagree*, 3 *neutral*, 4 *agree*, 5 *strongly agree*

of institutional-level supports (McConkey et al. 2000; Neef 1995).

Results from the study demonstrated that parents' acquisition of skills influenced the children's behaviors overall and the specific behaviors targeted by the training. The SDQ results showed that behaviors of a significant percentage of the children were within the average range following the training. The DBR showed positive changes for individual participants as well as throughout the group. These findings are important because they demonstrate that a brief training and continued support can bring about changes in child behaviors. Although it is important to demonstrate that parents can acquire skills during a brief training, it is perhaps more important to demonstrate that acquisition of the skills results in improved child behaviors. As found in other parent training studies, this component is critical for fully analyzing the results of a parent training program (Bearss et al. 2015).

The researchers hoped at the onset of this training that parents' self-confidence in managing their children's behaviors would increase following the parent training. This finding was partially shown. It appears that the PSE measure showed improvements, but *t* tests did not yield a significant result. The reason for this lack of significance could be the time frame of the study; other studies conducted this assessment with a longer space between pre-testing and post-testing (Grahame et al. 2015). However, on the DBR measures—which indicated self-confidence on the skills that had been components of the training (i.e., contingent praise, eye contact, and response interruption and redirection)—significant improvements were observed. In addition, action taken by parents showed significant changes from pretesting to posttesting. Following the training, the percentage of families who had been in the average range for distress increased significantly.

Social validity and alignment with parents' values are important for parent training to have a meaningful long-term impact (Barton and Fettig 2013; Dingfelder and Mandell 2011). The procedures and goals of the present study were considered valuable by the majority of the parents. Furthermore, 33.3% of parents reported that they trained others on the skills learned during the training. This is important because it demonstrates that parents were willing to train others outside of the setting and environment of the study itself (Questions 5 and 9). Question 7, "Allowing a fellow parent into my home fits my definition of hospitality" was the lowest scored item ($M=3.9$) which is interesting because of parents' indicated willingness to train others. The reasons for this are unclear but it could be that therapists are considered more trustworthy than other parents by this population, or that parents have needs beyond the scope of the training for which they preferred access to a therapist.

Limitations

A primary limitation to the design was the small sample size; thus the aggregated for the results should be interpreted with caution, and the need for attention to within-participant changes should be highlighted. Although the children had community autism diagnoses, constraints associated with the study environment prevented the authors from conducting formal diagnostic evaluations. Another limitation is that fewer than half of the parents were observed demonstrating the skills with their own children, as cultural and social values and practices involved with entering others' homes (among other challenges) prevented the investigators from observing children and their families in their homes. Another limitation is that all of the participants in the study were ethnically Macedonian, so the study did not represent an accurate cross-section of the ethnically diverse makeup of Macedonia. One possible reason was that recruitment efforts were conducted in the official language of the country. The two pretests and posttest relied primarily on rating scales and daily monitoring. It would have added to the study to conduct direct observations at all time points, but given the constraints of participants coming from cities far from the study and ethical considerations with filming, parents had the right to opt-out of a video component of the study. One limitation of the present study was that the children represented a broad range of abilities and a relatively large age range. Therefore, it was difficult to select specific interventions that would address these ranges.

Future Research

Future studies should evaluate effective parent training methods in additional countries that are facing economic, social, and political transformations. Although there are commonalities among these countries, there are many differences. The cultural milieu where behavior supports are implemented can impact their efficacy. Studies that address these issues are needed in parent training research. Researchers should also compare therapist delivered training to parent delivered training, especially in developing countries. A more complete cultural cross-section of targeted regions and a larger pool of participants would both be effective in enhancing the validity of future research. Future studies could evaluate other skills with a more homogeneous population. For example, parents of children who were younger or had minimal verbal skills could be taught naturalistic interventions to promote requests. Assessments could also be conducted prior to implementing parent training to target specific needs of parents in a given region.

Conclusion

The present study was an evaluation of a brief parent training model in the Republic of Macedonia. Results demonstrated that parents acquired the skills that were taught in the training meetings. In addition, the children of participants showed improvements with increased compliance and eye contact and with decreased repetitive behaviors following the training. Parents also improved their confidence throughout the course of the study.

Author Contributions BDH and VT supervised the project. VT coordinated the study location. VT and FJ recruited participants. BDH, LK, and SR analysed the data. LK coordinated data collection and management. FJ provided on-site translation and material preparation. CA provided back-translations and on-site language support. VT and FJ collected all follow-up data. BDH, ELO, CA, LK, SR, FJ, and VT contributed to the preparation of the manuscript.

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Compliance with Ethical Standards

Conflict of interest All the authors declare that they have no conflicts of interest.

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

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

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