



ELSEVIER

Contents lists available at ScienceDirect

Journal of Pediatric Nursing

journal homepage: www.pediatricnursing.org

Effect of incredible years autism spectrum and language delays (IY-ASD) program on stress and behavioral management skills among parents of children with autism spectrum disorder in Palestine

Mohammad Mahmoud Wahdan, RN, MSN^a, Malakeh Z. Malak, RN, Ph.D^{b,*}, Rasmieh Al-Amer, RN, Ph.D^{c,g}, Ahmad Ayed, RN, Ph.D^d, Sabrina Russo, Ph.D^e, Denise Ziya Berte, Ph.D^f

^a Saint John of Jerusalem Eye Hospital Group / Anabta branch Tulkarm, Palestine

^b Community Health Nursing, Faculty of Nursing, Al-Zaytoonah University of Jordan, Amman, Jordan

^c Mental Health Nursing, Faculty of Nursing, Isra University, Amman, Jordan; Adjunct fellow, Western Sydney University, School of Nursing and Midwifery

^d Pediatric Health Nursing, Faculty of Nursing, Arab American University Palestine, Jenin, Palestine

^e Clinical psychology, Birzeit University, Palestine

^f Clinical Psychology, An-Najah National University, Palestine

^g Western Sydney University, School of Nursing and Midwifery, Australia

ARTICLE INFO

Article history:

Received 27 August 2022

Revised 19 March 2023

Accepted 31 March 2023

Keywords:

Autism spectrum disorder

Incredible years autism spectrum and language delays program

Stress

Stress

Behavioral management skills

ABSTRACT

Purpose: This study purposed to evaluate the effect of the Incredible Years Autism Spectrum and Language Delays (IY-ASD) program in reducing parents' stress and improving aggressive and disruptive behaviors in the parents among parents of children with autism spectrum disorder in Palestine.

Design and methods: A one-group pre-posttest design was used. Thirty-four parents who enrolled in the Palestinian Child Institute in Nablus were recruited.

Results: Findings revealed a significant difference between parents' total stress pre and post-IY-ASD ($t = 1.2$, $p < 0.01$ and parents' behavioral management skills toward their children with autism spectrum disorder. The study demonstrated that the IY-ASD program for 16 sessions reduced stress among parents of children with autism spectrum disorder in Palestine and improved aggressive and disruptive behaviors in the parents.

Conclusion: The IY-ASD program can be successfully implemented for parents of this cohort group.

Practice implications: Healthcare providers can adopt such a program for enhancing parenting roles with their children experiencing autism spectrum disorder.

© 2023 Elsevier Inc. All rights reserved.

Introduction

Autism spectrum disorder (ASD) is classified by DSM-5 as a neuro-psychiatric developmental disorder characterized by difficulties in social communication (verbal and nonverbal), limited interest, and repetitive and or sensory behaviors (American Psychiatric Association, 2013). The prevalence of ASD globally was 0.6% (Salari et al., 2022). Additionally, current studies in Asia, the U.S., Europe, Africa, and Australia reported that the prevalence of ASD was 0.4%, 1%, 0.5%, 1%, and 1.7%, respectively (Salari et al., 2022).

Children with ASD experience limited desire to exchange experiences with others and reduced nonverbal communication, such as pointing, eye contact, or nodding. Which significantly reduced their

ability to develop positive and mutually beneficial relationships (Haisley, 2014). Hence, children with ASD suffer from developmental regression and impaired cognitive functions (Salari et al., 2022), which could occur as an isolated feature or in conjunction with malformation. Also, they experience challenges in carrying out daily activities, and difficulty in decision-making or changing their daily routines (Lord et al., 2018; Salari et al., 2022), requiring life-long care and support from their parents (World Health Organization, 2019). All the above-mentioned challenges could subject parents of ASD children to high levels of stress, anxiety, depression, and isolation (al-Farsi et al., 2016; Bonis, 2016; Bozkurt et al., 2019; Cohrs & Leslie, 2017; Estes et al., 2013; Keenan et al., 2016; Padden & James, 2017; Rezendes & Scarpa, 2011).

Early interventions are useful for both children with ASD and their families (Koegel et al., 2014), for example, counseling, family support (Jabery et al., 2014), and parents training were found to be useful in handling challenging behaviors in children with ASD

* Corresponding author at: Community Health Nursing, Faculty of Nursing, Al-Zaytoonah University of Jordan, P.O. Box: 130, Amman 11733, Jordan.
E-mail address: malakeh.m@zuj.edu.jo (M.Z. Malak).

(Bearss et al., 2015; Dretzke et al., 2009; Prata et al., 2018). Of note, community/ home-based parent-training program was effective in improving child's social communication and receptive language skills (Wetherby et al., 2014). Interventions that focus on parent-child interactions within the home environment have demonstrated encouraging improvements in children's social communication skills and other critical ASD symptoms (Stahmer & Pellecchia, 2015).

For example, the basic IY Incredible Years Autism Spectrum and Language Delays (IY-ASD) is a program that highlights the most important needs of the parents of children with ASD and provides developmentally relevant interventions (Dababnah et al., 2019; Dababneh & Parish, 2014; Valencia et al., 2021; Williams et al., 2020). IY-ASD provides parents opportunities to join and strategize new methods for supporting their children. The program incorporates role plays, homework, creating personal goals, and evaluation. It involves facilitators who use videotaped scenarios to spur dialogue, solve problems, and share ideas and participants who are provided with hand-outs, activities to implement at home, and reminder notes to put on their refrigerator (Incredible Years Programs, 2013). Also, IY-ASD can complement child therapies for children with behavioral challenges related to autism (Dababnah et al., 2019; Williams et al., 2020). Studies have reported that this program enhanced self-efficacy and parenting skills for parents with children suffering from ASD (Muschiatti-Piana, 2019). A wide range of studies reported strong evidence that the IY-ASD is highly beneficial for children with ASD and their parents (Dababnah et al., 2019; Dababneh & Parish, 2014; Incredible Years Programs, 2013; Valencia et al., 2021; Williams et al., 2020).

Concerning ASD in Middle Eastern countries, the services for children with ASD are facing many challenges and require continuous development (Jabery et al., 2014). Palestine is one of the lower middle-income countries in the Eastern Mediterranean region, in which sociocultural values and norms are compiled to a collectivist nature. To illustrate, family interests should be given priority in favor of an individual's interests when making a health-related decision. In Palestine, there are no available reports about the prevalence of children with ASD, a delay in accessing ASD-related services (Dababnah & Bulson, 2015), and a lack of screening practices (Dababnah & Parish, 2013). However, there is only one study that reported high levels of stress among Palestinian parents of children with ASD (Abou Dagga et al., 2013).

Nowadays, there is increasing concern about the issue of children with ASD. There are few institutions providing therapeutic care for children with few resources. Those children receive occupational therapy, speech therapy, and psychotherapy. However, these institutions provide interventions directed only at children with ASD. The current intervention program is a pioneer one because it tailored intervention to integrate the children's parents which in turn would establish a working partnership with their families.

Studies about these programs' effects on this affected group in Palestine are scarce. This study included Palestinian parents of children with ASD to enhance their abilities to manage their stress and improve their parenting behavioral management skills toward their children with ASD. Furthermore, this study could help healthcare professionals recognize and implement the IY-ASD program to enhance the mental health of parents of children with ASD.

Purpose and hypothesis

This study aimed to evaluate the effect of the IY-ASD program in reducing parents' stress and minimizing parents' negative behaviors toward their children with ASD in Palestine. The hypothesis was that the parents of children with autism would have lower stress and better parenting behavioral management skills after applying for the IY-ASD program as a therapeutic intervention.

Methods

Research design, setting, and sample

A pre-posttest with no control group design was applied over 14 weeks during the period from 9 February 2016 to 25 April 2017. The study was conducted at Palestinian Child Institute in Nablus. The Palestinian Child Institute operates a program enrolling 18–20 children with ASD annually. This institute provides services to children with autism, including the Rehabilitation, Education, and Caring for Hope (REACH) Program. These services are provided with a sum of money paid by the parents.

The sample size was calculated using the G* power analysis program version 3.0.10, in which the following parameters were used; moderate effect size = 0.5 (Dababneh & Parish, 2014), $p \leq 0.05$, and power = 0.85 with a *t*-test. The required sample size was 34 parents, including fathers and mothers. The present study recruited the participants using a convenience sampling method. A total of 36 parents from different families (one parent per family) were screened and agreed to participate in this program study; however, two participants declined for their non-willingness to participate. The flow of participants through intervention is clarified in Fig. 1.

The IY-ASD program was instituted by parents whose children are attending the Palestinian Child Institute. Those parents were informed about the IY-ASD program and asked for their participation through written materials and an orientation session. This study was designed to evaluate whether parent training would be superior for improving aggressive and disruptive behaviors in the parents of children with ASD.

The inclusion criteria for participation in this study were all parents aged 18 years and older. Also, all parents (mothers or fathers) have the potential to participate. Concerning children with ASD, the study included children with the same degree of ASD aged 2 to 8 years who attended the institute and had noncompliance or related behavioral difficulties that were determined by parent reports. The severity of ASD was determined according to the institution which used Childhood Autism Rating Scale (CARS). Only those that voluntarily registered were included.

Operational definitions

The Incredible Years Autism Spectrum and Language Delays (IY-ASD) is defined as a specific program that is created to address the social and emotional development of children with autism spectrum disorder (ASD) and language delays. The IY-ASD program is a parent-mediated training intervention and is designed to be used with children between 2 and 8 years of age (Incredible Years Programs, 2013).

Parents' negative behaviors in autism refer to actions or attitudes of parents that can have a negative impact on the development and well-being of a child with autism. Such as overreacting to minor misbehavior, using physical or verbal punishment, ignoring positive behavior, lack of consistency, lack of understanding, isolation, and high expectations (Abidin, 1995).

Measurements

A structured self-reported questionnaire was used including, the Parenting Stress Index-Arabic edition and the Incredible Years Questionnaire, and demographic data (e.g., a child with ASD and parent's age, a child with ASD and parent's gender, parent's marital status, parent's level of education, employment status, and others).

Parenting Stress Index (PSI) (Third edition) Arabic Edition was developed by Abidin (1995) and used to conduct this study. PSI consists of 120 items to assess parents' levels of stress using a 5-point Likert scale ranging from strongly agree to strongly disagree. The PSI scale consists of two domains (child and parent) and 19 optional items assessed life stress scale. The child domain consists of 47 items assessed stress

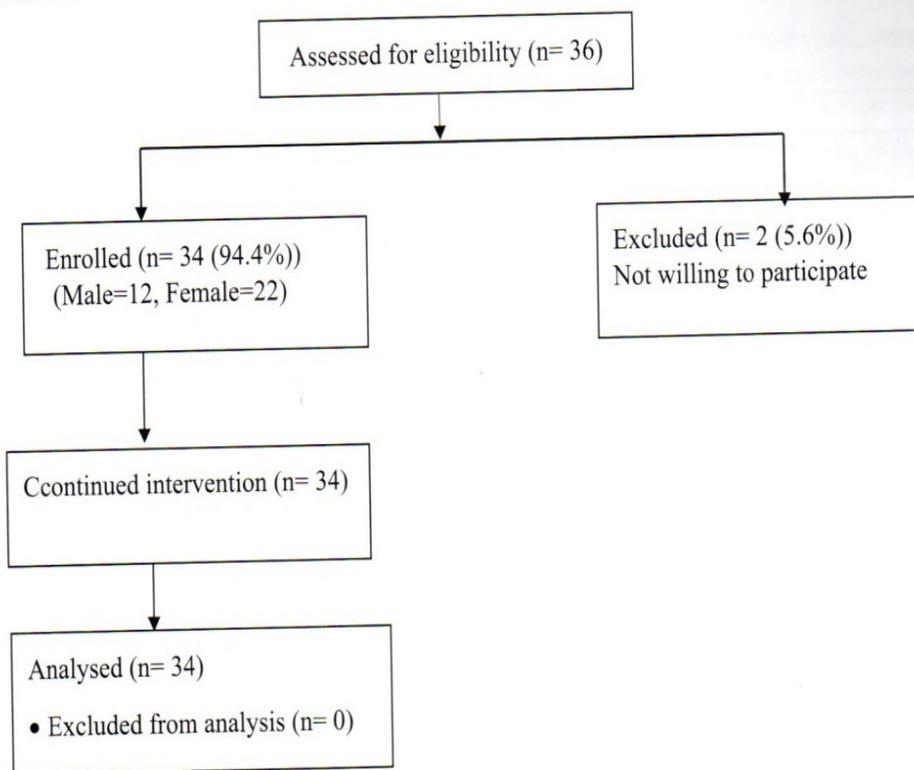


Fig. 1. Participants' flow in the study.

attributed to child characteristics such as distractibility/hyperactivity (9 items), adaptability (11 items), acceptability (7 items), demandingness (9 items), mood (5 items), and reinforces parent (6 items) and the parent domain that consists of 54 items evaluated stress associated with aspects of functioning in the parental role such as depression (9 items), attachment (7 items), competence (13 items), isolation (6 items), role restriction (7 items), spouse (7 items), and health (5 items). Only the two domains related to child and parent were included and these two domains are summed to yield a total stress score. The total stress scale score ranged from 101 to 505, and the total scores for child and parent domains were as follows: 47–235 and 54–270, respectively. The mean is the cut-off of the stress scale and domains, in which the higher mean indicated a higher stress scale and domains (Abidin, 1995). The mean for the stress scale and its domains were as follows: 303 for the total stress scale and 141 and 162 for the child and parent domains, respectively (Abidin, 1995). This scale is valid and reliable, in which internal consistency reliability with Cronbach's alpha was 0.90 (Abidin, 1995; Dunn et al., 2001; Miranda et al., 2019). Permission for the Arabic version of the instrument was obtained and purchased for use by the Palestinian Child Institute.

The *Incredible Years Questionnaire (IYQ) for Parents* was adopted to measure parents' behavioral skills toward their children with ASD. IYQ is a unidimensional scale with no subscales and consists of seven items including, pro-social behaviors, children's academic performance, positive interactions, praise, confidence, parental stress, and aggressive and destructive behaviors. The responses for items related to pro-social behaviors, children's academic performance, positive interactions, praise, confidence, and aggressive and destructive behaviors were yes or no, while for the item related to parental stress was decreased or increased. The scale scores were calculated as frequency and percentages for each item as recommended by the developer. This instrument was used by the Holy Child Program (HCP) in Beit Sahour, and it was validated by certified trainers of the Incredible Years Parenting Program in Palestine (Khoury, 2014). The Arabic version of the questionnaire was used to conduct this study; this version is valid and reliable (Khoury, 2014). The Cronbach's alpha for this scale in the current study was 0.83.

Afterward, the data collection process was performed as follows: firstly, invitation letters were sent to parents of 36 children with ASD, whereas these letters were placed in the school bag for each child.

Secondly, parents were contacted by phone to confirm their participation.

The agreed participants, where one parent/caregiver from each family, attended a baseline data collection session, which included filling out the consent form, and a questionnaire that included demographic data and the Parenting Stress Index Form. After that, the participants attended 14 weekly sessions utilizing the Incredible Years Parent program for parents of children with ASD. All parents had similar cultural contexts. Parents were divided into two groups, one for mothers and another one for fathers for cultural considerations, which prefer separation between gender. Although we divided the parents into two groups (one for mothers and the other one for fathers), all parents received the same training.

The groups were co-led by an English-speaking trainer from the United States who has a master's degree in clinical social work and certification as a trainer in basic IYP with experience in IYP-ASD. Also, there was a co-facilitator who was a native Arabic-speaking Palestinian healthcare provider who had training on the Incredible Years model. The co-facilitator provided simultaneous interpretation of live sessions and written translation of materials and videos.

Concerning the language, we can confirm that there were no language restrictions because all intervention was provided in the native language of the study participants "Arabic language" bearing in mind that those who carried out the intervention were Arabs, sharing the participants' language and the cultural norm as recommended by studies related to cross-cultural research (Al-Amer et al., 2015).

Program as therapeutic intervention procedures

The IY-ASD includes 16 sessions pertaining to the eight units outlined in the curriculum, with coordinated materials and exercises as explained in Table 1. Each unit contains strategies to address the child's behavior, the parent's interaction with the child, and the parent's coping strategies. Each session included four parts: (1) participant "check-in," where each parent discussed the previous week's successes and challenges with the group; (2) facilitator instruction of a new material, which involved videos and interactive discussions; (3) small and large group practice of skills; and (4) goal setting for the coming week and distribution of homework. Each session lasted approximately two hours. During

Table 1
IYP program-ASD curriculum.

Unit	Contents
Unit I: Child-directed narrated play promotes positive relationships	Parents learn to follow the child's lead and utilize his or her interests during play and to describe and comment on the child's actions, engaging in child-directed play, narrating and imitating play, waiting for the child to indicate choice, considering positioning for face-to-face interaction, encouraging verbal and nonverbal communication, and modeling and prompting play behaviors and language. Parents share in their children's favorite toys and foods, any hyper- or hypo sensitivities (e.g., sights, sounds, touch and smells), and the kinds of physical or sensory routines they enjoy (e.g., running, jumping, hide-and-seek games, songs).
Unit II: Pre-academic and persistence coaching promotes language development and school readiness	Parents learn to describe pre-academic concepts such as colors, shapes, object names, numbers and positions during play. The use of visual supports is encouraged for all children to support both expressive and receptive language development. Parents name the child's internal state when s/he is being patient, trying again, staying calm, concentrating, persisting with a challenging task, or trying to engage in joint play. Parents explore how to support their children to persevere with tasks such as brushing their teeth, getting dressed or doing a puzzle.
Unit III: Social coaching promotes friendship skills	Parents learn to use reading, gesturing, prompting and modeling to promote turn-taking skills, increase children's enjoyment of social interactions through shared sensory activities (e.g., dancing, bouncing on a trampoline, swinging), and prompting and enhancing face-to-face joint attention. They learn how to use social coaching during play interactions with their child to encourage critical social skills. Parents learn how to follow the child's lead, and praise social skills such as getting dressed for school and toilet training.
Unit IV: Emotion coaching promotes emotional literacy	Parents learn the importance of drawing attention to their child's feelings by using emotion coaching. Parents start this coaching by naming their child's emotions at the time their child is experiencing them, they learn the importance of describing and naming the feelings of book characters to help their children learn feeling words. Parents learn to use social coaching, in combination with emotion coaching, and take turns when reading, to point out a picture and use partial prompts, by pausing to let the child fill in the answer. Physical games (e.g., water play, spinning) can be used to motivate a child's feeling vocabulary.
Unit V: Pretend play promotes empathy and social skills	Parents learn how to encourage their children's imaginary play skills; group leaders help the parents discuss how to encourage empathy, emotion language, and social behaviors such as helping, sharing, waiting and trading through pretend play. The use of puppets, dolls, or other figures is another effective way parents can encourage children's imaginary play. Parents also structure interactions that involve nonverbal responses from their child (e.g., "Would you like to shake the puppet's hand?").
Unit VI: Promoting children's self-regulation skills	Parents participates in scenarios designed to help children use visual tools, such as "calm down thermometer," and practice self-calming strategies, such as positive imagery, self-talk words, and deep breathing. For example, parents view a video vignette where a father is helping his child learn about breathing by practicing taking big breaths while visualizing smelling a flower and blowing out a candle.
Unit VII: Using praise and rewards to motivate children.	Parents learn to directly and clearly praise children for positive behaviors. Parents discuss methods to enhance praise with a warm tone or enthusiasm, smiles, eye contact, as well as gestures or specific language. For example, one of the vignettes shows a boy who has been rather aggressive with his cat. His parents give him attention and label praise whenever he is gentle with his cat in order to teach him what it means to be gentle. They also learn how to add to the impact of praise by pairing praise with tangible rewards such as their child's favorite stickers, bubbles, or special food items. The group leader helps parents learn how to praise and reward themselves, and other family members, for their parenting efforts.
Unit VIII: Effective limit setting and behavior management.	Parents learn ways to give positive, clear, simple and necessary limits or instructions, transition their children to new activities using visual-auditory tools (buzzers, music, sand timers and songs), use command cards, and positive reminders, and utilize proactive discipline approaches such as distractions, redirections, and ignoring selected misbehaviors.

sessions, participants were taught specific parenting techniques due to ASD. They were encouraged to share their personal progress using these methods and videos. Further, the program included written exercises, guided conversations, homework suggestions, and role play.

After every two units, a program-specific questionnaire was administered to monitor parenting behaviors. A weekly program evaluation was completed to monitor participants' interaction with the program. At the completion of the program, participants received a certificate and a final individual data collection session was administered (not more than one hour) to examine the program's effects. Participants were encouraged to give feedback at each session and reminded on a regular basis of the voluntary nature of their participation in the program, as a whole, and in each activity presented. All participants attended the intervention sessions.

The participating parents voluntarily filled out all surveys. A mental health professional was available in to deal with any case surveys-induced distress or discomfort. Parents were already familiar with Palestinian Child Institute and attended regular parent sessions related to their child's rehabilitation there. Contacts for professional counseling services were available to all participants if the content or process of participating in the program created distress or discomfort.

Ethical considerations

The study was approved by the Institutional Review Board (IRB) at An-Najah National University before data collection. Informed consent

forms with full disclosure about the study and its benefits and potential risks were given and explained to all potential participants before the study.

The ethics of mutual confidentiality and respect between the participants were established during the first session and reinforced throughout the program. Also, participants were able to terminate participation at any time if they were not satisfied with the program.

Statistical analysis

Data were analyzed using SPSS version 23 software. The normality analysis was performed for the dependent variable using Kolmogorov-Smirnov ($K-S$) test was used and the data were within normal distribution ($p = 0.426$). Also, there were no missing data. Descriptive statistics (mean, SD, frequency, and percentages) were utilized to analyze the demographic data for the participants. The paired t -test was used to compare the differences between total stress, and the chi-square was used to examine the differences between behavioral management skills. The level of significance was set at $p \leq 0.05$.

Results

Thirty-four parents completed this study, and there were no outliers. The mean age of the parents was 42.5 years ($SD \pm 8.83$) with a range of 26–63 years. The mean age of the children with ASD age was 6.5 years

Table 2
Characteristics of participants (N = 34).

Variable	n (%)	M (SD)
Parents' age		42.5 ± 8.83
Children with ASD age		6.5 ± 1.92
Parent's gender		
Female	22 (64.7)	
Male	12 (35.3)	
Children' with ASD gender		
Female	8 (23.5)	
Male	26 (76.5)	
Parent's level of Education		
Secondary school and less	9 (26.5)	
Diploma (2 years)	7 (20.6)	
Bachelor's degree and higher	18 (52.9)	
Employment Status		
Employed	20 (58.8)	
Unemployed	14 (41.2)	
Family income/month		1212 \$ ± 456.85 \$
Number of years' children received services		3.19 ± 0.84

n: number; %:percentage; M = mean; SD = Standard Deviation.

(SD ± 1.92), with a range of 5–8 years. More than half of the parents (64.7%) were mothers, and around two-thirds of children with ASD (76.5%) were males. More than half of the parents (54.8%) completed a bachelor's degree or higher. The majority of the parents (64.5%) were employed. The mean family income/month was 1.212 \$ (SD ± 456.85). More details are depicted in Table 2.

The effect size of our study was 0.5, indicating a moderate effect size. The results of our statistical analysis showed a significant difference between the pre-post IY-ASD program for total stress with ($p < 0.05$); ($t = 1.2, p < 0.01$), child domain ($t = 3.31, p < 0.01$), and parent domain ($t = 3.92, p < 0.05$). There was a statistically significant lowering in total stress, child domain, and parent domain after implementing the IY-ASD program (Table 3). Scores on four of six child subdomains decreased significantly from pre to post-intervention. PSI means related to adaptability decreased from 37 (SD ± 5.08) at baseline to 32.94 (SD ± 5.62) post-intervention ($p < 0.01$). Reinforces subdomain parent score decreased from 15.87 (SD ± 3.38) at the beginning of the intervention to 14.16 (SD ± 3.01) post-intervention ($p \leq 0.01$). Also, mood decreased from 15.26 (SD ± 3.51) at baseline to 13.84 (SD ± 3.00) post-intervention

Table 3
Differences in means between pre-post IY-ASD program regarding total parents' stress and according to gender.

Variables	Pre-IY-ASD Mean (SD)	Post- IY-ASD Mean (SD)	t-test	p- value	Gender p-value
Total Child Domain	156.87 ± 17.97	145.77 ± 19.41	3.31	0.002**	0.980
Male	156.92 ± 18.08	145.48 ± 19.39			
Female	156.82 ± 17.86				
Distractibility/hyperactivity	32.2 ± 3.4	31.7 ± 3.0	0.68	0.454	0.187
Male	32.32 ± 3.5	31.73 ± 3.02			
Female	31.10 ± 3.3	31.67 ± 2.98			
Adaptability	37.0 ± 5.08	32.94 ± 5.62	0.99	0.001**	0.708
Male	37.3 ± 5.09	33.00 ± 5.63			
Female	36.7 ± 5.07	32.88 ± 5.61			
Reinforces parent	15.87 ± 3.38	14.16 ± 3.01	0.63	0.011**	0.145
Male	15.97 ± 3.41	14.20 ± 3.03			
Female	15.77 ± 3.35	14.12 ± 2.99			
Demandingness	29.13 ± 5.07	29.23 ± 4.17	1.01	0.925	0.104
Male	29.25 ± 5.6	29.26 ± 4.21			
Female	29.01 ± 4.54	29.20 ± 4.13			
Mood	15.26 ± 3.51	13.84 ± 3.0	0.62	0.030*	0.135
Male	15.41 ± 3.53	13.87 ± 3.03			
Female	15.11 ± 3.49	13.81 ± 2.97			
Acceptability	25.00 ± 4.21	22.03 ± 3.40	0.71	0.001**	0.956
Male	25.04 ± 4.31	22.06 ± 3.68			
Female	24.95 ± 4.11	22.00 ± 3.12			
Total Parent Domain	156.22 ± 22.71	147.27 ± 21.32	3.92	0.030*	0.216
Male	156.30 ± 22.8	147.44 ± 21.63			
Female	156.14 ± 22.62	147.10 ± 21.01			
Competence	34.29 ± 7.59	33.29 ± 6.48	1.37	0.473	0.212
Male	34.38 ± 7.62	33.47 ± 6.61			
Female	34.20 ± 7.56	33.11 ± 6.35			
Attachment	17.89 ± 2.49	18.37 ± 3.06	0.57	0.415	0.248
Male	17.93 ± 2.52	18.39 ± 3.11			
Female	17.81 ± 2.46	18.35 ± 3.01			
Role restriction	23.59 ± 4.61	23.40 ± 3.90	0.69	0.781	0.102
Male	23.61 ± 4.63	23.46 ± 4.01			
Female	23.57 ± 4.59	23.34 ± 3.79			
Depression	25.81 ± 3.98	23.03 ± 4.84	0.97	0.007**	0.168
Male	25.89 ± 4.01	23.04 ± 4.89			
Female	25.73 ± 3.95	23.02 ± 4.79			
Spouse	19.37 ± 4.69	18.37 ± 4.31	1.04	0.342	0.220
Male	19.41 ± 4.72	18.38 ± 4.35			
Female	19.33 ± 4.66	18.36 ± 4.27			
Isolation	18.67 ± 5.47	16.00 ± 2.62	1.03	0.015*	0.979
Male	18.80 ± 5.52	16.08 ± 2.66			
Female	18.54 ± 5.42	15.92 ± 2.58			
Health	16.19 ± 4.09	14.67 ± 2.79	0.47	0.051	0.185
Male	16.27 ± 4.16	14.73 ± 2.92			
Female	16.11 ± 4.02	14.61 ± 2.66			
Total stress	310.03 ± 38.95	287.90 ± 37.93	1.20	0.002**	0.240
Male	310.11 ± 39.02	287.93 ± 37.97			
Female	309.95 ± 38.88	287.87 ± 37.89			

M = Mean, SD = Standard deviation.

* Significant at the $p < 0.05$ level; ** Significant at the $p < 0.01$ level.

Table 4
Differences between pre-post IY-ASD program regarding parents' negative behaviors.

Variables	Pre-IY-ASD n (%)	Post-IY-ASD n (%)	Chi-square test	p-value
Social behaviors			7.3	0.045*
Yes	27 (79.4)	32 (94.1)		
No	7 (20.6)	2 (6.5)		
Children's academic performance			15.7	0.001**
Yes	27 (79.4)	30 (88.2)		
No	7 (20.6)	4 (11.8)		
Positive interactions			11.1	0.022*
Yes	29 (85.3)	32 (94.1)		
No	5 (14.7)	2 (6.5)		
Praise			14.4	0.013*
Yes	27 (79.4)	32 (94.1)		
No	7 (20.6)	2 (6.5)		
Parental stress			4.9	0.036*
Increased stress	20 (58.8)	5 (14.7)		
Decreased stress	14 (41.2)	29 (85.3)		
Aggressive and disruptive behaviors			15.7	0.001**
Yes	27 (79.4)	4 (11.8)		
No	7 (20.6)	30 (88.2)		
Confidence			4.4	0.041*
Yes	9 (26.5)	32 (94.1)		
No	25 (73.5)	2 (6.5)		

n: number; %:percentage.

* Significant at the ≤ 0.05 level; ** Significant at the ≤ 0.01 level.

($p < 0.05$). The acceptability score decreased from 25.0 (SD \pm 4.21) to 22.0 (SD \pm 3.40) post-intervention ($p < 0.01$). There were statistically significant differences in PSI means within the parental subdomains for depression, isolation, and health. PSI means scores related to depression reduced by 25.81 (SD \pm 3.98) to 23.03 (SD \pm 4.84) post-intervention ($p < 0.01$). Similarly, PSI scores related to isolation reduced from baseline 18.67 (SD \pm 5.47) to 16.00 (SD \pm 2.62) post-intervention at ($p \leq 0.01$). Also, health scores reduced from 16.19 (SD \pm 4.09) at baseline to 14.67 (SD \pm 2.79) post-intervention ($p \leq 0.05$).

Table 4 shows the difference between the pre-post IY-ASD program for parents' behavioral management skills toward their children with autism. There was a significant difference between the pre-post IY-ASD program for social behaviors (Chi-square = 7.3, $p < 0.05$), children's academic performance (Chi-square = 15.7, $p < 0.01$), positive interactions (Chi-square = 11.1, $p < 0.05$), praise the child with ASD (Chi-square = 14.4, $p < 0.05$), parental stress (Chi-square = 4.9, $p < 0.05$), aggressive and disruptive behaviors (Chi-square = 15.7, $p < 0.01$), and confidence (Chi-square = 4.4, $p < 0.05$). There was a statistically significant improvement in positive social behaviors, children's academic performance, positive interactions, praise, and confidence. In addition, there was a statistically significant lowering in parental stress and aggressive and disruptive behaviors after attending the IY-ASD program. Also, there were no differences between the pre-post IY-ASD program for parents' behavioral management skills toward their children with Autism according to gender.

Discussion

The IY-ASD program had an effect in lowering parents' stress and reducing parents' negative behaviors toward their children with ASD in Palestine. The findings of this study should be interpreted considering the power and the effect size of the sample, in which we used an effect size of 0.5 which is considered moderate in size suggesting that the variables are moderately related, and the effect is meaningful but may not be as strong as a large effect size. In other words, a moderate effect size could indicate that the IY-ASD program is moderately effective compared to the control group, thus, further investigation may be needed to determine its practical significance and clinical relevance and maintain the validity of the study. In this study, we used a more conservative

alpha level, such as 0.01 or 0.001 to maintain the validity of the study for the following domains: total child domain, adaptability, reinforces parent, mood, depression, isolation, and total stress.

Findings indicated that participating in IY-ASD program group sessions positively influenced parents' stress and positive behaviors. A potential interpretation might be related to that this program has been held within groups and group activities executed in support of collectivist cultures and communities like Arab descendants (Ismail et al., 2020; Malak et al., 2022; Malak et al., 2021; Sharour et al., 2020; Yehia et al., 2020). Overall, the stress levels and domains were improved after the program. The child domain was improved although it did not reach the cut-off point.

The IY-ASD program in this study has significantly reduced the total stress levels among parents of children with ASD in Palestine. These results reported better outcomes in comparison with the findings of previous studies held among parents of preschool children with autism in Palestine (Dababneh & Parish, 2015; Dababneh & Parish, 2014; Khoury, 2014). These studies demonstrated decreased levels of total stress related to children among parents after program completion for 19 weeks. A potential explanation for the current study results could be related to the length of the program, which could influence the ways of decreasing stress related to parents by providing them with better experiences. The results of previous studies and the current study showed that the IY-ASD program could decrease total stress among parents of children with ASD. Therefore, this finding suggested that the IY-ASD program is appropriate and effective for parents of children with ASD.

Our study findings showed a positive effect of the IY-ASD program for parents of children with ASD in improving behavioral management skills by reducing negative parent behaviors (e.g., decreased parent aggressive and disruptive child behavior, decreased mothers and fathers' use of physical force and other harsh punishment toward their children) and improving parent's perceptions of positive behaviors (e.g., increased parental use of praise and increased pro-social behaviors, pointing to a positive cultural shift). These present study results lend support to the results from studies among Netherlands parents of children with disruptive behaviors (Leijten et al., 2017; Menting et al., 2013) and conduct problems (Leijten et al., 2018), Palestinian parents of children with ASD (Dababneh & Parish, 2014), Irish parents of children with conduct problems (McGilloway et al., 2012), American parents practicing child maltreatment (Hurlburt et al., 2013), American parents of children with developmental disabilities (McIntyre, 2008), and British parents of children with disruptive behaviors (Gardner et al., 2007). Surprisingly, this current study demonstrated consistent results with previous studies reflecting different cultures which may have different barriers to the success of such programs. This consistency might be related to other factors such as modernization changes in family roles according to new life requirements and educational progress in the Palestinian population.

Academic performance may be especially worrisome for parents of children with ASD. In the current study, there were clear improvements in this domain among children over the time parents participated in the IY-ASD. Similar findings were upheld in a previous study by Khoury (2014), in which only one mother of all participants stated that her child's academic performance did not improve since attending the IY-ASD.

Unexpectedly, our study revealed no differences between parental total stress pre-post intervention and parent-child relationship according to gender. This result is inconsistent with previous studies that demonstrated mothers had more stress and a strong relationship with their children with ASD compared with fathers (Hartley et al., 2011; Kim & Mahoney, 2004). These findings could suggest that it is important to note that a gender role among Palestinians is evolving toward more involvement of a father figure in the children's lives. This shift is fundamental because it gives Palestinian males more opportunities than ever to share with Palestinian females and play an integral role in the

rearing process of their children, particularly when a child has a disability. This current result is congruent with a previous Palestinian study that demonstrated there was a change among highly educated fathers in childcare responsibilities and tasks (Kashkoush et al., 2021).

In addition, all parents enrolled in our study were educated, and more than half of them had tertiary education. Thus, education may impact the gap in terms of gender differences among this group of people. Thus, it is plausible that the differences between the role of mothers and fathers could be less apparent. Keep in mind we strongly believe that a longitudinal study is highly important to investigate a cause and effect in this kind of relationship is highly recommended.

Limitations of the study

Despite the important findings of this study and adding Arab parents of children with ASD to the body of literature, there were some limitations that must be taken into consideration. The study findings are based on parent-reported measures instead of observer-based measures; thus, these reports could be biased. This study used a pre-posttest design and there was no randomization or control group to determine the changes that may occur due to the experimental treatment. A very long period of time between pre-post and no control group; thus it is impossible to tell if the changes were due to other factors besides IY-ASD. Also, our results are based on a single-site study and parents' reports, and the sample was based on accessible parents of children with ASD enrolled at the Palestinian Child Institute.

Implications for practice

Conclusion

The current study confirmed that the IY-ASD program for 16 sessions reduced the stress among parents of children with ASD in Palestine and improved parents' behavioral management skills, which reflects positive behaviors toward their children after participation in the program. Thus, the IY-ASD program can be successfully implemented in this unique population, the parents of children with ASD. Further, we recommend a multi-site study among parents of children with ASD because they yield more generalizable findings. Also, a replication study could be conducted with the control group in order to evaluate the effectiveness of such a program.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethics approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (An-Najah National University).

Consent to participate (include appropriate consent statements)

Each participant provided informed consent before beginning the study.

Consent for publication (consent statement regarding publishing an individual's data or image)

Not applicable.

Availability of data and material (data transparency)

Not applicable.

Code availability (software application or custom code)

Not applicable.

CRediT authorship contribution statement

Mohammad Mahmoud Wahdan: Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. **Malakeh Z. Malak:** Methodology, Data curation, Software, Validation, Writing – original draft, Writing – review & editing. **Rasmieh Al-Amer:** Methodology, Validation, Writing – original draft, Writing – review & editing. **Ahmad Ayed:** Methodology, Validation, Writing – original draft, Writing – review & editing. **Sabrina Russo:** Methodology, Validation, Writing – original draft, Writing – review & editing. **Denise Ziya Berte:** Methodology, Validation, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

No potential conflict of interest was reported by the authors.

References

- Abidin, R. R. (1995). *Parenting stress index* (3rd ed.). Odessa, FL: Psychological Assessment Resources.
- Abou Dagga, S. K., Al Jeesh, Y., & Abou Dagga, S. (2013). *Psychological stress and resilience among parents of autistic children in Gaza strip*. Master thesis. <http://search.mandumah.com/Record/695012>.
- Al-Amer, R., Ramjan, L., Glew, P., Darwish, M., & Salamonsen, Y. (2015). Translation of interviews from a source language to a target language: Examining issues in cross-cultural health care research. *Journal of Clinical Nursing*, 24(9–10), 1151–1162.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders: (DSM-V)* (5th ed.). Arlington, VA: American Psychiatric Publishing. <https://doi.org/10.1176/appi.books.9780890425596>.
- Bearss, K., Johnson, C., Smith, T., Lecavalier, L., Swiezy, N., ... Scabill, L. (2015). Effect of parent training vs parent education on behavioral problems in children with autism spectrum disorder: A randomized clinical trial. *JAMA*, 313(15), 1524–1533. <https://doi.org/10.1001/jama.2015.3150>.
- Bonis, S. (2016). Stress and parents of children with autism: A review of literature. *Issues in Mental Health Nursing*, 37(3), 153–163. <https://doi.org/10.3109/01612840.2015.1116030>.
- Bozkurt, G., Uysal, G., & Düzkyaya, D. S. (2019). Examination of care burden and stress coping styles of parents of children with autism spectrum disorder. *Journal of Pediatric Nursing*, 47, 142–147.
- Cohrs, A. C., & Leslie, D. L. (2017). Depression in parents of children diagnosed with autism spectrum disorder: A claims-based analysis. *Journal of Autism and Developmental Disorders*, 47(5), 1416–1422.
- Dababnah, S., & Bulson, K. (2015). On the sidelines: Access to autism-related Services in the West Bank. *Journal of Autism and Developmental Disorders*, 45(12), 4124–4134. <https://doi.org/10.1007/s10803-015-2538-y>.
- Dababnah, S., Olson, E. M., & Nichols, H. M. (2019). Feasibility of the incredible years program for preschool children on the autism spectrum in two US sites. *Research in Autism Spectrum Disorders*, 57, 120–131. <https://doi.org/10.1016/j.rasd.2018.10.010>.
- Dababnah, S., & Parish, S. L. (2013). At a moment, you could collapse: Raising children with autism in the West Bank. *Children and Youth Services Review*, 35(10), 1670–1678. <https://doi.org/10.1016/j.chilyouth.2013.07.007>.
- Dababnah, S., & Parish, S. L. (2015). Feasibility of an empirically-based program for parents of preschoolers with autism Spectrum disorder. *Autism*, 20(1), 85–95. <https://doi.org/10.1177/1362361314568900>.
- Dababneh, S., & Parish, S. L. (2014). Incredible years program tailored to parents of preschool with autism: Pilot research. *Research on Social Work Practice*, 10, 1–14. <https://doi.org/10.1177/1049731514558004>.
- Dretzke, J., Davenport, C., Frew, E., Barlow, J., Stewart-Brown, S., Bayliss, S., Taylor, R., Sandercock, J., & Hyde, C. (2009). The clinical effectiveness of different parenting programmes for children with conduct problems. *Child and Adolescent Psychiatry and Mental Health*, 3(1), 7. <https://doi.org/10.1186/1753-2000-3-7>.
- Dunn, M. E., Burbine, T., Bowers, C. A., & Tantleff-Dunn, S. (2001). Moderators of stress in parents of children with autism. *Community Mental Health Journal*, 37(1), 39–52. <https://doi.org/10.1023/a:1026592305436>.
- Estes, A., Olson, E., Sulliva, K., Greenson, J., Winter, J., Dawson, G., & Munson, J. (2013). Parenting-related stress and psychological distress in mothers of toddlers with autism spectrum disorders. *Brain & Development*, 35(2), 133–138. <https://doi.org/10.1016/j.braindev.2012.10.004>.

- al-Farsi, O., al-Farsi, Y., al-sharbaty, M., & al-adawi, S. (2016). Stress, anxiety, and depression among parents of children with autism spectrum disorder in Oman: A case-control study. *Neuropsychiatric Disease and Treatment*, 2016(12), 1943–1951.
- Gardner, F., Shaw, D. S., Dishion, T. J., Burton, J., & Supplee, L. (2007). Randomized prevention trial for early conduct problems: Effects on proactive parenting and links to toddler disruptive behavior. *Journal of Family Psychology*, 21, 398–406. <https://doi.org/10.1037/0893-3200.21.3.398>.
- Haisley, L. D. (2014). *Parenting stress in parents of young children with autism spectrum disorders: The role of child characteristics and social support* Master's thesis 696.
- Hartley, S. L., Barker, E. T., Seltzer, M. M., Greenberg, J. S., & Floyd, F. J. (2011). Marital satisfaction and parenting experiences of mothers and fathers of adolescents and adults with autism. *American Association on Intellectual and Developmental Disabilities*, 116(1), 81–95. <https://doi.org/10.1352/1944-7558-116.1.81>.
- Hurlburt, M. S., Nguyen, K., Reid, J., Webster-Stratton, C., & Zhang, J. (2013). Efficacy of the incredible years group parent program with families in head start who self-reported a history of child maltreatment. *Child Abuse & Neglect*, 37(8), 531–543. <https://doi.org/10.1016/j.chiabu.2012.10.008>.
- Incredible Years Programs (2013). Retrieved from: <http://www.incredibleyears.com/>.
- Ismail, K., Malak, M., & Al-amer, R. (2020). Psychosocial correlates of work-related fatigue among Jordanian emergency department nurses. *Perspectives in Psychiatric Care*, 56(1), 46–53.
- Jabery, A. L., Arabiat, H., Al Khamra, H., Betawi, I., & Abdel Jabbar, S. (2014). Parental perceptions of services provided for children with autism in Jordan. *Journal of Child and Family Studies*, 23, 475–486. <https://doi.org/10.1007/s10826-012-9703-0>.
- Kashkoush, S., Kassom, S., & Gershy, N. (2021). *Change and stability in the paternal role among Palestinian fathers living in Israel*. Preprint <https://doi.org/10.21203/rs.3.rs-1042185/v1>.
- Keenan, B. M., Newman, L. K., Gray, K. M., & Rinehart, N. J. (2016). Parents of children with ASD experience more psychological distress, parenting stress, and attachment-related anxiety. *Journal of Autism and Developmental Disorders*, 46(9), 2979–2991. <https://doi.org/10.1007/s10803-016-2836-z>.
- Khoury, I. (2014). Final report from holy child program. *Training for group leaders in the Incredible Years Parenting Program and the implementation of such a program for mothers in Beit Sahour/ Palestine*.
- Kim, J., & Mahoney, G. (2004). The effects of mother's style of interaction on children's engagement: Implications for using responsive interventions with parents. *Topics in Early Childhood Special Education*, 24(1), 31–38.
- Koegel, L. K., Koegel, R. L., Ashbaugh, K., & Bradshaw, J. (2014). The importance of early identification and intervention for children with or at risk for autism spectrum disorders. *International Journal of Speech-Language Pathology*, 16(1), 50–56. <https://doi.org/10.3109/17549507.2013.861511>.
- Leijten, P., Raaijmakers, M., Wijngaards, L., Matthys, W., Menting, A., Hemink-van Putten, M., & Orobio de Castro, B. (2018). Understanding who benefits from parenting interventions for Children's conduct problems: An integrative data analysis. *Prevention Science*, 19(4), 579–588. <https://doi.org/10.1007/s11121-018-0864-y>.
- Leijten, P., Raaijmakers, M. A., Orobio de Castro, B., van den Ban, E., & Matthys, W. (2017). Effectiveness of the incredible years parenting program for families with socioeconomically disadvantaged and ethnic minority backgrounds. *Journal of Clinical Child and Adolescent Psychology*, 46(1), 59–73. <https://doi.org/10.1080/15374416.2015.1038823>.
- Lord, C., Elsabbagh, M., Baird, G., & Veenstra-Vanderweele, J. (2018). Autism spectrum disorder. *Lancet*, 392(10146), 508–520.
- Malak, M., Shuhaiber, A., Al-amer, R., Abuads, M., & Aburoomi, R. (2022). Correlation between psychological factors, academic performance and social media addiction: Model-based testing. *Behaviour & Information Technology*, 41(8), 1583–1595.
- Malak, M., Tawableh, L., & Alamer, R. (2021). Depressive symptoms among older Jordanian patients with Cancer undergoing treatment. *Clinical Gerontologist*, 44(2), 133–142. <https://doi.org/10.1080/07317115.2020.1818660>.
- McGilloway, S., Ní Mháille, G., Furlong, M., Hyland, L., Leckey, Y., Kelly, P., ... Donnelly, M. (2012). The incredible years Ireland study parents, teachers, and early childhood intervention: Long-term outcomes of the incredible years parent and teacher classroom management training programmes. *Clinical Child Psychology and Psychiatry*, 17(4), 616–630. <https://doi.org/10.1177/1359104511426406>.
- McIntyre, L. L. (2008). Parent training for young children with developmental disabilities: Randomized controlled trial. *American Journal of Mental Retardation*, 113(5), 356–368. <https://doi.org/10.1352/2008.113:356-368>.
- Menting, A. T., Orobio de Castro, B., & Matthys, W. (2013). Effectiveness of the incredible years parent training to modify disruptive and prosocial child behavior: A meta-analytic review. *Clinical Psychology Review*, 33(8), 901–913. <https://doi.org/10.1016/j.cpr.2013.07.006>.
- Miranda, A., Mira, A., Berenguer, C., Rosello, B., & Baixauli, I. (2019). Parenting stress in mothers of children with autism without intellectual disability. Mediation of behavioral problems and coping strategies. *Frontiers in Psychology*, 10, 464. <https://doi.org/10.3389/fpsyg.2019.00464>.
- Muschiatti-Piana, V. E. (2019). *Changes in parental self-efficacy following "Autism spectrum disorder & language delay incredible years®" parenting program (unpublished dissertation)*. London: Middlesex.
- Padden, C., & James, J. E. (2017). Stress among parents of children with and without autism Spectrum disorder: A comparison involving physiological indicators and parent self-reports. *Journal of Developmental and Physical Disabilities*, 29(4), 567–586. <https://doi.org/10.1007/s10882-017-9547-z>.
- Prata, J., Lawson, W., & Coelho, R. (2018). Parent training for parents of children on the autism spectrum: A review. *International Journal of Clinical Neurosciences and Mental Health*, 5(3). <https://doi.org/10.21035/ijcnmh.2018.5.3>.
- Rezendes, D. L., & Scarpa, A. (2011). Associations between parental anxiety/ depression and child behavior problems related to autism Spectrum disorders: The roles of parenting stress and parenting self-efficacy. *Autism Research and Treatment*, 2011, Article 395190. <https://doi.org/10.1155/2011/395190.D395190>.
- Salari, N., Rasoulpoor, S., Rasoulpoor, S., Shohaimi, S., Jafarpour, S., Abdoli, N., ... Mohammadi, M. (2022). The global prevalence of autism spectrum disorder: A comprehensive systematic review and meta-analysis. *Italian Journal of Pediatrics*, 48, 112. <https://doi.org/10.1186/s13052-022-01310-w>.
- Sharour, L. A., Omari, O. A., Salameh, A. B., & Yehia, D. (2020). Health-related quality of life among patients with colorectal cancer. *Journal of Research in Nursing*, 25(2), 114–125. <https://doi.org/10.1177/1744987119846177>.
- Stahmer, A. C., & Pellecchia, M. (2015). Moving towards a more ecologically valid model of parent-implemented interventions in autism. *Autism*, 19(3), 259–261.
- Valencia, F., Urbiola, E., Romero-González, M., Navas, I., Elías, M., Garriz, A., ... Villalta, I. (2021). Protocol for a randomized pilot study (FIRST STEPS): Implementation of the incredible years-ASLD® program in Spanish children with autism and preterm children with communication and/or socialization difficulties. *Trials*, 22(1), 291. <https://doi.org/10.1186/s13063-021-05229-1>.
- Wetherby, A. M., Guthrie, W., Woods, J., Schatschneider, C., Holland, R. D., Morgan, L., & Lord, C. (2014). Parent-implemented social intervention for toddlers with autism: An RCT. *Pediatrics*, 134(6), 1084–1093. <https://doi.org/10.1542/peds.2014-0757>.
- Williams, M. E., Hastings, R. P., & Hutchings, J. (2020). The incredible years autism spectrum and language delays parent program: A pragmatic, feasibility randomized controlled trial. *Autism Research*, 13(6), 1011–1022. <https://doi.org/10.1002/aur.2265>.
- World Health Organization (2019). Autism spectrum disorders. Retrieved from: <https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders>.
- Yehia, D., Malak, M., Al-Thwabih, N., Awad, R., Al-Ajouri, E., Darwish, S., & Hamad, A. (2020). Psychosocial factors correlate with fatigue among pregnant women in Jordan. *Perspectives in Psychiatric Care*, 56(1), 46–53. <https://doi.org/10.1111/ppc.12372>.

