Journal of Pediatric Nursing 63 (2022) 159–167

Contents lists available at ScienceDirect

Journal of Pediatric Nursing

journal homepage: www.pediatricnursing.org

Parental self-efficacy and family quality of life in parents of children with autism spectrum disorder in China: The possible mediating role of social support

Yongshen Feng [a], Xuezhen Zhou [b], Xiuqun Qin [c], Guiyi Cai [d], Yeqing Lin [e], Yongli Pang [f,h], Biyuan Chen [g], Tao Deng [a], Lifeng Zhang [a,*]

[a] School of Nursing, Sun Yat-Sen University, Guangzhou, China
[b] Nursing department, Sun Yat-Sen Memorial Hospital, Sun Yat-Sen University, Guangzhou, China
[c] Pediatric Department, The Third Affiliated Hospital, Sun Yat-Sen University, Guangzhou 510630, China
[d] Pediatric Department, Sun Yat-Sen Memorial Hospital, Sun Yat-Sen University, Guangzhou, China
[e] Research Management Department, The Third Affiliated Hospital, Sun Yat-Sen University, Guangzhou 510630, China
[f] Nursing Department, The Third Affiliated Hospital, Sun Yat-Sen University, Guangzhou, China
[g] Pediatric Department, The Third Affiliated Hospital, Sun Yat-Sen University, Guangzhou
[h] The Third Affiliated Hospital, Sun Yat-Sen University, Guangzhou, China

ARTICLE INFO

Article history:
Received 4 June 2021
Revised 18 October 2021
Accepted 18 October 2021

Keywords:
Autism spectrum disorder
Family quality of life
Parental self-efficacy
Social support
Structural equation model

ABSTRACT

Objective: This study explored the related factors of FQOL in parents of children with ASD and examined whether social support mediates the relationship between parental self-efficacy and FQOL in parents of children with ASD.
Design and methods: Using a cross-sectional design, a total of 260 parents of children with ASD were recruited from September 2019 to November 2020. They completed the Beach Center Family Quality of Life Scale, the Parenting Sense of Competence Scale, and the Social Support Rating Scale.
Results: Parental self-efficacy and social support explained approximately 49.5% of the variance in FQOL. After controlling for the confounding influence of parents' education level, parental self-efficacy had a direct effect on FQOL ($\beta = 0.292$, $SE = 0.108$, $P < 0.01$) and an indirect effect on FQOL ($\beta = 0.165$, $SE = 0.069$, $P < 0.01$). Effects were mediated through social support, with partial mediating effects accounting for 36.11% of the total effect.
Conclusions: Both parental self-efficacy and social support are critical to promoting FQOL, and a partial mediating effect of social support was established.
Practical implications: Interventions for families with children with ASD should focus on enhancing parental self-efficacy, followed by a perceived social support and FQOL prompt.

Introduction

Autism spectrum disorder (ASD) is a set of heterogeneous neurodevelopmental conditions characterized by early-onset difficulties in social communication and unusually restricted, repetitive behaviors and interests (APA, 2013). The worldwide population prevalence of ASD is about 1% (Lord et al., 2018; Toscano et al., 2021). Because daily training is regarded as the most effective intervention for children with ASD, long-term or even lifelong rehabilitation training is critical to promoting the prognosis of children with ASD (Woodman et al., 2015). However, the insufficient rehabilitation service provision for families of children with ASD is frequently reported worldwide and in China, which has a large population with ASD (Liu et al., 2020). In China, less than one-third of children with ASD receive intervention services in public medical institutions, and most receive interventions services in high-cost private rehabilitation centers (Zou et al., 2020). Despite the high medical expenses, most parents have to quit their jobs to take care of their children full-time because rehabilitation requires the company and participation of parents, and at the same time the rehabilitation outcome is limited, which increases the financial burden and psychological pressure on parents, leading to impaired family health and poor family quality of life (Balcells-Balcells, Gine, et al., 2019; Naheed et al., 2020; Ou et al., 2015). Exploring effective strategies to enhance FQOL of families with children with ASD is an urgent issue.

FQOL is defined as "a condition where the family needs are met, and family members enjoy their life together as a family and have the

* Corresponding author at: School of Nursing, Sun Yat-Sen University, 74 Zhongshan Road II, Yuexiu District, Guangzhou, Guangdong Province 510080, China.
E-mail addresses: linyq77@mail2.sysu.edu.cn (Y. Lin), Chenbiy2@mail.sysu.edu.cn (B. Chen), zhlfeng@mail.sysu.edu.cn (L. Zhang).

https://doi.org/10.1016/j.pedn.2021.10.014
0882-5963/

chance to do things which are important to them" (Park et al., 2003). Enhancing FQOL is the indirect and final outcome of interventions for children with ASD, whereas behavior amelioration represents the direct outcome (Magnusson et al., 2019). There have been inconsistent results regarding the level of satisfaction with FQOL and its five dimensions[1] (Balcells-Balcells, Gine, et al., 2019; Schlebusch et al., 2016; Zeng et al., 2020). Most previous studies focusing primarily on older children demonstrated that parents of children with ASD had a mean score range of 3–4 in FQOL. (The possible score range was 1–5, (Balcells-Balcells, Giné, et al., 2019; Schlebusch et al., 2016; Zeng et al., 2020) Among five dimensions[1], two studies showed parents had relatively higher satisfaction with family interaction and lower satisfaction with emotional well-being (Balcells-Balcells, Giné, et al., 2019; Zeng et al., 2020), while one study reported disability-related support was a relatively high score domain (Schlebusch et al., 2016). Therefore, it is worthwhile to explore satisfaction with FQOL and its related factors in parents of young children with ASD.

Social support has been conceptualized as the provision of physical, emotional, informational, and instrumental assistance that is appraised as part of one's social network (Dunst & Trivette, 1986), and is regarded as a critical protective factor of health outcomes among families of children with ASD (Marsack & Samuel, 2017). Previous studies found that families of children with ASD had lower social support than families of children with typical development (Garrido et al., 2020). Social support was positively related to FQOL and was determined to be a critical component of family interventions. The cultivation of supportive social relationships has the potential to improve FQOL (Balcells-Balcells, Giné, et al., 2019; Bishop-Fitzpatrick et al., 2018; Kuru & Piyal, 2018). With more support, parents of children with ASD may experience lower parental stress (Zeng et al., 2020), better partnerships with professionals (Balcells-Balcells, Giné, et al., 2019), and better FQOL (Balcells-Balcells, Giné, et al., 2019). Although there was evidence of a positive association between social support and FQOL, there is limited information about whether social support acts as a mediator between cognitive variables and FQOL in families of children with ASD.

Parental self-efficacy is defined as a subset of an individual's personal self-efficacy and refers to an individual's self-appraisal of competency in a parenting role (Bandura, 1977), which is a critical factor for the effectiveness of parenting training programs in families of children with ASD (Russell & Ingersoll, 2020). An experimental study showed that parents of children with ASD experienced lower levels of parental self-efficacy than parents of typically developing children (Zhou et al., 2019). Although the attention toward maintaining adequate parental self-efficacy in families of children with ASD is of great importance, there is not enough evidence to demonstrate the association between parental self-efficacy and FQOL (Isa et al., 2016). Most studies have focused on enhancing parental self-efficacy and exploring the associated factors including parental psychological well-being and health outcomes (Luque et al., 2017; Russell & Ingersoll, 2020; Zhou et al., 2019). Among these studies, a cross-sectional study involving 129 parents of children with ASD suggested that high parental self-efficacy is associated with higher life satisfaction (Luque et al., 2017). Yet, there are not enough studies focusing on the positive relationship between parental self-efficacy and social support (Weiss et al., 2013). In conclusion, there are presently few studies exploring the relationship between parental self-efficacy and social support, and parental self-efficacy and FQOL.

Since FQOL is an essential family health outcome, many studies have been designed to identify the positive and negative factors of FQOL (Isa et al., 2016). According to Zuna's theoretical model of FQOL (Zuna et al., 2011), FQOL has four components: systematic concepts, family-unit factors, individual family member factors, and performance factors. Moreover, parental self-efficacy and social support are critical predictors of FQOL, specifically for families with disabled members. In addition, the cultivation hypothesis of the social cognitive theory developed by (Benight & Bandura, 2004) posits that self-efficacy facilitates social support directly and facilitates health outcomes through social support. Based on the social cognitive theory, self-efficacious parents may be more effective in adopting effective coping strategies and eliciting support from their surroundings when facing an ASD diagnosis and life dilemmas, which contributes to better health outcomes. However, there is insufficient evidence regarding the mediator role of social support between parental self-efficacy and FQOL (Isa et al., 2016). At present, it is crucial to understand the relationship between parental self-efficacy and social support, and their interaction in the prediction of FQOL. This would aid in the design of better psychosocial family interventions for families of children with ASD.

Based on the above theories and evidence in the literature, we propose that both parental self-efficacy and social support are positively related factors of FQOL. Moreover, parental self-efficacy facilitates social support and might have a positive indirect effect on FQOL through social support. Through improving parental self-efficacy, parents can feel more confident when frustrated with their child's repetitive behavior (Noyan et al., 2020) and they would be more prone to seeking, receiving, and perceiving a high level of social support (Weiss et al., 2013). This may contribute to better satisfaction with FQOL in families of children with ASD (Kuru & Piyal, 2018). Thus, studies have emphasized the essential mediating role that social support plays between parental stress and FQOL in parents of children with ASD (Zeng et al., 2020), and the benefits of social support for better FQOL (Brand et al., 2016), caregiver burden, and quality of life (Marsack & Samuel, 2017). However, one study on cancer patients found that the relationship between self-efficacy and quality of life was not mediated by social support (Banik et al., 2017). Since there is not enough evidence supporting the mediating role played by social support between parental self-efficacy and FQOL in families of children with ASD, it is worthwhile to examine the intermediary role of social support in families of children with ASD. This knowledge would contribute to effective family interventions.

Apart from parental self-efficacy and social support, the sociodemographic information of families, children with ASD, including the parents' gender, age, occupation status marital status, family income, and the child's gender and age are regarded essential FQOL-related factors (Isa et al., 2016). For instance, parents' education level was found to be significantly related to health outcomes and QOL (Magnusson et al., 2019). Parents with a low education level were at a greater risk for less support and experienced worse health-related QOL (Isa et al., 2016). To rigorously examine the inner relationships between parental self-efficacy, social support, and FQOL, it is important to control confounding and statistically significant demographic factors.

In conclusion, although there are some studies focusing on parental self-efficacy, social support, and FQOL in families of children with ASD, but there are no studies examining the mediating role that social support may play between parental self-efficacy and FQOL. Our three study aims were as follows: (1) to explore the related factors (sociological demographic data, parental self-efficacy, and social support) of FQOL; (2) to examine the mediating role of social support between parental self-efficacy and FQOL; (3) to validate the hypothetical structural equation model including parents' education level, parental self-efficacy, social support, and FQOL. These study findings would be conducive to providing guidance to formulate targeted family support interventions, which would enhance health outcomes and FQOL in parents of children with ASD.

Methods

Participants

A cross-sectional survey design was used. A convenience sample of 273 parents of children with ASD in outpatient clinics from two tertiary

[1] Family interaction, parenting, emotional well-being, physical/material well-being, and disability-related support.

hospitals in Guangzhou, China, was recruited from September 2019 to November 2020. Parent inclusion criteria were that they had been living with their children for the past 6 months and were able to complete questionnaires. Parents diagnosed with serious chronic diseases in the past 3 months were excluded. Inclusion criterion for children was diagnosis of ASD by a certified doctor according to the ICD-10 or DSM-V at least one month prior, with ASD being the primary diagnosis (Kim et al., 2016). Children diagnosed with chronic illness, being treated after an accident, or having undergone a surgery in the past 3 months were excluded. For each child, only one parent (father or mother) was included in this study.

A total of 273 questionnaires were issued, and 260 valid questionnaires were collected, resulting in a 95.24% valid return rate. The demographic information of the 260 enrolled participants is shown in Table 1. Participants were predominantly mothers (59.2%) with a mean age of 33.93 ($SD = 5.28$) years. Most (62.3%) worked full-time, one-third had a bachelor's degree and above, and only twelve parents were unmarried. The children included 206 boys and 54 girls, and the average age was 3.69 years ($SD = 1.64$). When first visiting the hospital, 25.4% of the children were misdiagnosed. A total of 38.1% of parents thought their children's severity of ASD was moderate. The average age of children at the first visit was 2.93 ($SD = 1.01$) years and the average age of children at diagnosis of ASD was 3.22 ($SD = 1.32$) years. The mean time from the first visit to diagnosis with ASD was 3.56 ($SD = 9.03$) months, and the time from diagnosis with ASD to data collection was 6.34 ($SD = 11.44$) months. More than half (63.1%) were receiving a therapeutic intervention at the time of data collection.

Table 1
Background characteristics of parents and their children with ASD ($N = 260$).

Variables	%(n)	Mean ± SD
Parents		
Gender of respondents		
Father	40.8% (106)	
Mother	59.2% (154)	
Age (years)		33.93 ± 5.28
23–	43.1% (112)	
30–	47.3% (123)	
40–54	9.6% (25)	
Education level		
Junior college and below (Junior college, High school, Secondary school, and primary school)	57.7% (150)	
Master's degree	33.8% (88)	
Bachelor's degree	8.5% (22)	
Occupation status		
Full-time	62.3% (162)	
Others (unemployed, part-time or retired)	37.7% (98)	
Marital status		
Married	95.4% (248)	
Others (divorce or separation)	4.6% (12)	
Monthly household income per capita (yuan)		
≤4000	24.2% (63)	
4000–8000	39.6% (103)	
≥8000	36.2% (94)	
Children		
Gender		
Male	79.2% (206)	
Female	20.8% (54)	
Age (years)		3.69 ± 1.64
2–	73.5% (191)	
4–	19.6% (51)	
6–14	6.9% (18)	
The diagnosis of first visit		
ASD	74.6% (194)	
Global developmental delay	13.1% (34)	
Language retardation	8.8% (23)	
Motor retardation	2.7% (7)	
Mental retardation	0.8% (2)	
The severity of ASD (measured by parents)		
Mild	24.6 (64)	
Moderate	38.1 (99)	
Severe	37.3 (97)	
Whether with therapeutic intervention		
Yes	63.1% (164)	
No	36.9% (96)	
Age at first visit hospital (years)		2.93 ± 1.01
Age at diagnosis (years)		3.22 ± 1.32
Time from first visit to diagnosis with ASD (months)		3.56 ± 9.03
Time from diagnosis with ASD to data collection (months)		6.34 ± 11.44

Measures

Participants completed a survey that included three questionnaires and demographic information, which totaled 66 questions: Beach Center Family Quality of Life Scale (Beach Center FQOL) (Poston et al., 2003); Parenting Sense of Competence Scale (PSOC) (Gibaud-Wallston & Wandersman, 1978); and Social Support Rating Scale (SSRS) (Xiao, 1994). The demographic questionnaire included items on sociodemographic data (age and gender of children; parents' age, gender, education level, occupation status, marital status, and per capita monthly income of families) and clinical data (diagnosis, treatment, child's age of first hospital visit, child's age of first diagnosis, time from the first visit to the diagnosis of ASD, and time from diagnosis with ASD to data collection).

The Chinese version of the Beach Center FQOL measured individual FQOL (Hu et al., 2012). The Chinese version of the Beach Center FQOL was translated by Hu (Hu et al., 2012). There are two measurement forms including importance and satisfaction, and the satisfaction form was used based on the research aims. The 25-item scale has five subscales, including (1) satisfaction with family interaction (6 items, family enjoys spending time together), (2) parenting (6 items, family members help the children), (3) emotional well-being (4 items, family has the support to relieve stress), (4) physical/material well-being (5 items, family members take care of themselves), (5) and disability-related support (4 items, covering the family members' special and professional support needs in school or work, at home, making friends, and keeping relations with service providers working with families with a disability). Each item is rated on a 5-point Likert-type scale ranging from 1 (very dissatisfied) to 5 (very satisfied) and the total Beach Center FQOL score ranges from 25 to 125 theoretically, with higher scores indicating higher satisfaction with FQOL. The Chinese version of the Beach Center FQOL showed good internal consistency with a total Cronbach's alpha of 0.93 in 442 Chinese families of a child with intellectual disabilities (Hu et al., 2012). The total Cronbach's alpha was 0.908 and ranged from 0.730 to 0.871 for the five sub-scales in the current study.

The Chinese version of the PSOC measures individual parental self-efficacy (Gibaud-Wallston & Wandersman, 1978). The original POSC was developed by Gibaud-Wallston and Wandersman (1978), and the Chinese version of the PSOC was translated by Ngai (Ngai et al., 2007). The 17-item scale has two sub-scales including efficacy (PSOC-E, 8 items) and satisfaction (PSOC-S, 9 items). Each item is rated on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree), and the total POSC score ranges from 17 to 102 theoretically, with higher scores indicating higher parental self-efficacy and satisfaction. The Chinese version of POSC showed good internal consistency with a total Cronbach's alpha of 0.85 and a 4-week test-retest reliability of 0.87 in 170 Chinese mothers of healthy babies (Ngai et al., 2007). The total Cronbach's alpha was 0.801 and ranged from 0.651 to 0.704 for the two sub-scales in the current study.

The SSRS measured individual social support. The original SSRS was developed by Xiao (1994). The 10-item scale has three sub-scales, including objective support (3 items, the attained substantive supports), subjective support (4 items, the individual's subjective emotional experience), and support utilization (3 items, the individual's utilization of resources in social networks). The total SSRS score ranges from 12 to 66 theoretically, with higher scores indicating better perceived social support. A total score of ≤22 indicates a low level, 23–44 indicates a moderate level, and ≥ 45 indicates a high level of social support. The

SSRS showed good internal consistency with a total Cronbach's alpha of 0.89, and a test-retest reliability of 0.92 in Chinese families (Xiao & Yang, 1987). The total Cronbach's alpha was 0.679 and ranged from 0.538 to 0.674 for the three dimensions in the current study.

Procedures

This study was approved by the Institutional Review Board and Clinical Medical Research Ethics Committee of the Third Affiliated Hospital of Sun Yat-sen University and Sun Yat-sen Memorial Hospital. The research team included a doctor, nurses, and postgraduate students. The doctor was responsible for validating the inclusion criteria of participants, the nurses were in charge of the explanation and organization of data collection, and the postgraduate students passed out and collected questionnaires. All the participants individually completed the questionnaire when attending a health lecture about ASD in the hospital after signing an informed consent. Questionnaires were filled in anonymously and retrieved immediately after completion; most participants filled in the questionnaire in 10 to 15 min. Each participant was given a watercolor pen and a towel in return for completing the questionnaire.

Data analysis

The data were analyzed using IBM SPSS Statistics version 20 (SPSS Inc., USA). Means, standard deviations, percentages, and frequencies were used to describe the sociodemographic variables of parents and children. Bivariate Pearson correlations were performed to examine the association between parental self-efficacy, social support, FQOL, and their dimensions. Statistical significance was set at $P < 0.01$.

The structural equation model (SEM) was performed to explore the interrelations between parental self-efficacy, social support, and FQOL. The SEM was established and verified using AMOS version 23 (Ruiz et al., 2010). Maximum likelihood estimation was used to correct and fit the model, and Hayes's (Hayes & Preacher, 2014) bias-corrected bootstrapping method was used to test the mediating effects. The standard errors were bootstrapped with 2000 samples in order to obtain bias-corrected confidence intervals. Five fit indices were obtained to test the goodness of fit of the proposed model. A P of x^2 greater than 0.05 ($P > 0.05$) and a chi-square degree ratio (x^2/df) in the range of 1–3 are indicative of an acceptable fit. Root mean square error of approximation (RMSEA) values below 0.05 indicate a close model fit. The comparative fit index (CFI) and the Tucker–Lewis fit index (TLI) (Ruiz et al., 2010) between 0.90 and 0.95 indicate an acceptable model fit, with values greater than 0.95 indicating a close model fit. In order to improve the model, bidirectional covariate paths between different error variances were built according to the modification indices function (Ruiz et al., 2010).

The SEM consists of three measurement models (Parental self-efficacy, Social support, and FOOL) and a structural mode featuring the direct effect that parenting self-efficacy has on FQOL as well as the indirect effect that parenting self-efficacy has on FQOL through social support. Based on this, we added parents' education level as a covariable to the model. Parents' education level was a three-level categorical variable where Junior college and below = 1, bachelor's degree = 2, and master's degree = 3. The first aim of the model was to examine the mediating effects of social support between parental self-efficacy and FQOL. The second aim was to examine the validity of three measurement models. The third aim was to test whether the direct and indirect effects of parental self-efficacy on FQOL were affected by the combination of parents' education level.

Results

Satisfaction with family quality of life in parents of children with ASD

Table 2 shows that the total Beach Center FQOL score was 78.92 (SD = 14.70) and the item mean score was 3.15 (SD = 0.59), which suggested a moderate level of satisfaction with FQOL based on a 5-point Likert scale. Parents were most satisfied with family interaction (M = 3.75, SD = 0.95) and less satisfied with emotional well-being (M = 3.13, SD = 0.80) and disability-related support (M = 2.71, SD = 0.89).

One-Way ANOVA showed that the total Beach Center FQOL score in parents of children with ASD was statistically significant based on the difference in parents' education level ($F = 3.90$, $P < 0.01$). The multiple comparison showed that families where parents had a master's degree scored higher on FQOL than families with parents having a bachelor's degree ($P < 0.01$), finishing junior college, high school, secondary school, and primary school ($P < 0.01$).

Correlations between family quality of life, parental self-efficacy, and social support

The descriptive statistics of PSOC and SSRS are shown in Table 2. The total score and the item mean PSOC score were 62.10 (SD = 8.50) and 3.65 (SD = 0.50), respectively. Parents reported higher scores in the efficacy sub-scale ($M = 3.73$, $SD = 0.63$) than in the satisfaction sub-scale ($M = 3.59$, $SD = 0.58$). The total score and item mean SSRS score were 35.77 (SD = 6.91) and 3.58 (SD = 0.69), respectively. Parents reported high scores in the subjective support sub-scale ($M = 20.37$, $SD = 4.87$), while a lower score was reported in the support utilization sub-scale ($M = 6.66$, $SD = 1.58$) and the objective support sub-scale ($M = 8.74$, $SD = 2.35$).

The bivariate Pearson correlations between parental self-efficacy, social support, and FQOL and their dimensions are shown in Table 3. A statistically significant and positive association was found between parental self-efficacy and social support ($r = 0.191$, $P < 0.01$), FQOL and parental self-efficacy ($r = 0.261$, $P < 0.01$), and FQOL and social support ($r = 0.414$, $P < 0.01$). Results indicated that all dimensions of parental self-efficacy and social support were significantly associated with FQOL. Subjective support was most strongly associated with FQOL (r = 0.380, $P < 0.01$), followed by support utilization (r = 0.302, $P < 0.01$), and efficacy ($r = 0.234$, $P < 0.01$). (See Table 3.)

SEM results

The indirect effects of parental self-efficacy on FQOL through social support was examined. Model fit indices suggested that the model succeeded ($x^2/df = 5.915$, $P = 0.000$, $RMSEA = 0.138$, 95%CI [0.119, 0.157], $CFI = 0.755$, $TLI = 0.655$). In the model, the coefficient of indirect effect was 0.171, which was lower than that of the direct effect (0.272). The partial mediating effect of social support accounted for 38.51% of the total effect, and parental self-efficacy and social support explained approximately 46.3% of the variance in FQOL. After adding parents' education level as a covariable to model, model fit indices suggested that the proposed model succeeded ($x^2/df = 4.835$, $P = 0.000$, $RMSEA$ = 0.122, 95%CI [0.105, 0.139], $CFI = 0.756$, $TLI = 0.672$). The modification indices function was used to determine if the machine proposed additional change that would further improve it. Then, to adjust error covariance, a bidirectional covariate path was added between e1 (the error variance of family interaction of FQOL) and e2 (the error variance of parenting of FQOL) in the model. The model was improved significantly and had an excellent fit ($x^2/df = 1.297$, $P = 0.099$, $RMSEA$ = 0.034, 95%CI [0.000, 0.058], $CFI = 0.982$, $TLI = 0.975$). (Fig. 1).

Regarding the three measurement models, the standardized factor loading of each latent variable and the observed sub-scales were as follows: 0.45–0.78 for parental self-efficacy, 0.42–0.77 for social support, and 0.42–0.80 for FQOL. The e1–e10, representing the measurement errors of each observed variable to estimate the latent variable, were as follows: 0.21–0.61 for parental self-efficacy, 0.17–0.60 for social support, and 0.17–0.64 for FQOL. The e11 (0.49) and e12 (0.09) represented the residual terms of FQOL and social support, respectively. All factor loading exceeded the cutoff of 0.40, and all standardized measurement errors and residual terms were less than 2.58, which indicated that

Table 2
Descriptive statistics of parental self-efficacy, social support and family quality of life ($N = 260$).

	Mean ± SD of total score	Observed range and min-max	Theoretical range and min-max	*Mean ± SD* of item mean score
Beach Center FQOL (Satisfaction with FQOL)	78.92 ± 14.70	29–123	25–125	3.15 ± 0.59
Family interaction	19.48 ± 5.35	6–30	6–30	3.24 ± 0.89
Parenting	18.82 ± 4.73	6–30	6–30	3.76 ± 0.95
Emotional well-being	12.58 ± 3.20	4–20	4–20	3.14 ± 0.80
Physical/material well-being	17.21 ± 3.48	5–25	5–25	3.44 ± 0.70
Disability-related support	10.83 ± 3.56	4–20	4–20	2.71 ± 0.89
PSOC (parental self-efficacy)	62.10 ± 8.50	40–95	17–102	3.65 ± 0.50
Efficacy	29.78 ± 5.08	12–46	8–48	3.73 ± 0.63
Satisfaction	32.32 ± 5.26	18–52	9–54	3.60 ± 0.58
SSRS (social support)	35.77 ± 6.91	16–52	12–66	3.58 ± 0.69
Objective support	8.74 ± 2.35	3–16	1–22	2.91 ± 0.78
Subjective support	20.37 ± 4.87	9–22	8–22	5.09 ± 1.22
Support utilization	6.66 ± 1.58	3–11	3–22	2.22 ± 0.53

BC FQOL, Beach Center family quality of life; PSOC, Parenting Sense of Competence Scale; SSRS, Social Support Rating Scale.

parental self-efficacy, social support, and FQOL were adequately measured by their observed sub-scales.

Regarding the structural model, parents' education level, parental self-efficacy and social support explained approximately 49.5% of the variance in FQOL, and parental self-efficacy explained 9.2% of the variance in social support. The standardized path coefficients from parents' education level to FQOL was significant at the 0.05 level ($\beta = 0.140$, $SE = 0.063$, $P < 0.05$). After regarding parents' education level as a covariate, it showed that parental self-efficacy not only had a direct effect on FQOL ($\beta = 0.292$, $SE = 0.108$, $P < 0.01$), but also an indirect effect on FQOL through social support ($\beta = 0.165$, $SE = 0.069$, $P < 0.01$). The total effect of parental self-efficacy on FQOL was significant ($\beta = 0.457$, $SE = 0.098$, $P < 0.01$). This supports the hypothesis that social support played a partial mediating role between parental self-efficacy and FQOL, and indirect effects accounted for 36.11% of the total effects, which supports our hypothesis (Fig. 1 and Table 4).

Compared to the original model without controlling for covariance, the modified model provided that: (1) the combination with parents' education level did not change the relative weaker indirect association between parental self-efficacy and FQOL through social support, compared with the direct association between parental self-efficacy and FQOL. (2) With the combination of parents' education level, the indirect effects through social support became weaker.

Discussion

Family quality of life among parents of children with autism spectrum disorder

The results showed that within 6.34 months (on average) after a diagnosis of ASD, parents of children with ASD showed a moderate level of satisfaction with FQOL based on a 5-point Likert scale. This was similar to 226 Chinese parents in Zeng's study and lower than parents' satisfaction with FQOL in Spain and South Africa (Balcells-Balcells, Giné, et al., 2019; Schlebusch et al., 2016; Zeng et al., 2020). One of the possible reasons for this discrepancy could be that parents of children with ASD in Spain received relatively more support than Chinese parents of children with ASD. Another possible reason was that parents attained more special ASD-related services in South Africa. The results demonstrate that FQOL among parents of children with ASD needs to be improved, and more professional services should be provided to families of children with ASD in China.

In addition, our results showed that parents were most satisfied with family interaction, which was consistent with findings of other studies (Balcells-Balcells, Giné, et al., 2019; Zeng et al., 2020). This implies that effective communication between family members was an essential part of parental daily life, and finding ways to promote effective communication among family members is a direction to be considered in future family interventions. In addition, our results showed that disability-related support was the lowest satisfaction domain, and emotional well-being was the second lowest one. It was not consistent with some studies in other countries, such as those that reported that the emotional well-being domain had the lowest satisfaction (Balcells-Balcells, Giné, et al., 2019; Schlebusch et al., 2016; Zeng et al., 2020), and in one study disability-related support was the high score domain (Schlebusch et al., 2016). The possible reasons are that parents in some previous studies had already received professional support, while children in the current study were at the early stage of diagnosis and 36.9% of them even had no access to intervention services, not to mention other kinds of support. This implies that the provided emotional and professional support could not meet Chinese parents' actual

Table 3
Pearson's correlation among Parental self-efficacy, Social support, and Family quality of life ($N = 260$).

	F	P	S	F1	F2	F3	F4	F5	P1	P2	S1	S2
F	–											
P	0.261*	–										
S	0.414*	0.191*	–									
F1	0.789*	0.124	0.260*	–								
F2	0.803*	0.136	0.249*	0.740*	–							
F3	0.731*	0.256*	0.435*	0.386*	0.444*	–						
F4	0.670*	0.281*	0.339*	0.283*	0.282*	0.556*	–					
F5	0.566*	0.208*	0.266*	0.151	0.200*	0.406*	0.490*	–				
P1	0.234*	0.816*	0.186*	0.053	0.105*	0.306*	0.279*	0.198*	–			
P2	0.197*	0.830*	0.129	0.149	0.118	0.119	0.185*	0.145	0.354*	–		
S1	0.226*	0.091	0.628*	0.170*	0.175*	0.181*	0.192*	0.096	0.080	0.071	–	
S2	0.380*	0.187*	0.917*	0.233*	0.220*	0.439*	0.292*	0.245*	0.179*	0.129	0.334*	–
S3	0.302*	0.122	0.607*	0.164*	0.150	0.279*	0.295*	0.263*	0.142	0.059	0.227*	0.427*

F = family quality of life, F1 = family interaction, F2 = parenting, F3 = emotional well-being, F4 = physical/material well-being, F5 = disability-related support, P = parental self-efficacy, P1 = efficacy, P2 = satisfaction, S = social support, S1 = objective support, S2 = subjective support, S3 = support utilization.
* $p<.01$.

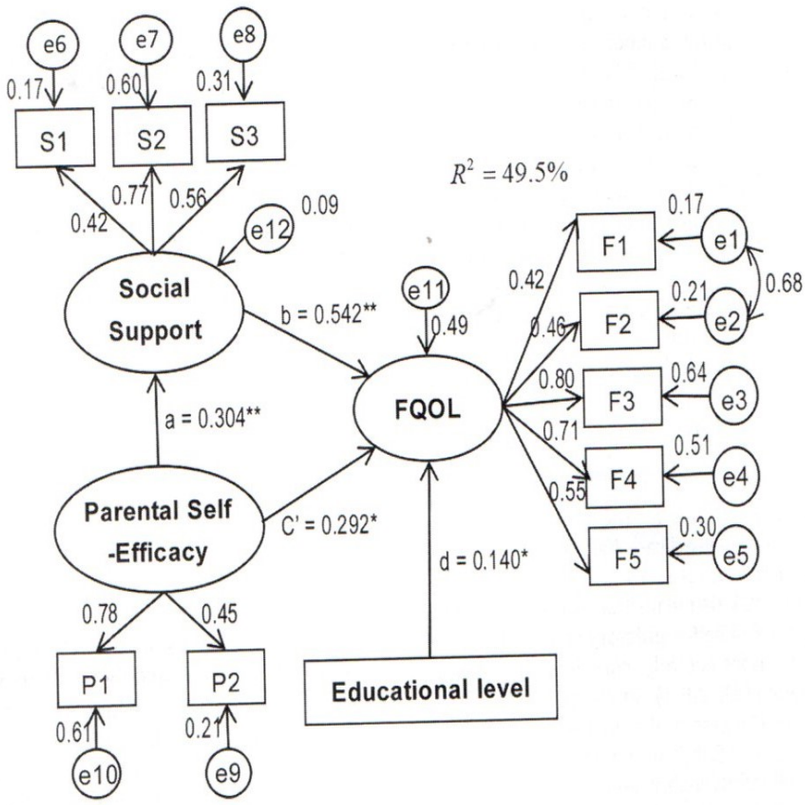

Fig. 1. Structural equation model of cultivation hypothesis containing parents' education level.
Note. *$P < 0.05$; **$P < 0.01$. Parents' education level is a categorical co-variable and is described as a three-level categorical variable where junior college and below = 1, bachelor's degree = 2, and master's degree = 3. FQOL = Family quality of life, F1 = family interaction, F2 = parenting, F3 = emotional well-being, F4 = physical/material well-being, F5 = disability-related support. S1 = subjective support, S2 = objective support, S3 = support utilization, P1 = efficacy, P2 = satisfaction. e1–e10 represent the measurement errors of each observed variable (rectangle) to estimate the latent variable (ellipse); e11 (0.49) and e12 (0.09) represent the residual value of FQOL and social support. a means the effect of parental self-efficacy on social support, b means the effects of social support on FQOL, c means the direct effect of parental self-efficacy on FQOL, and d means the effect of educational level on FQOL.

needs, and that the disability-related support system for children with ASD in China needs to be further improved. Previous studies reported that families without any type of support service lacked informal support from friends and had low satisfaction with FQOL, which might be disadvantageous to the emotional health of the families (Bertelli et al., 2011; Fong et al., 2020), and this conclusion supported the results of the present study. It suggests that parental distress and stress should be identified and treated in a timely manner, and there should be more family cooperation activities and professional support for the child's studying and making friends in school provided to families of children with ASD (Zeng et al., 2020). It might be effective to integrate the emotional and ASD-related support services into parent-involved training programs, to contribute to better psychological health and satisfaction with FQOL (Liu et al., 2020).

Interrelations between parental self-efficacy, social support, and FQOL

Results showed that social support, especially subjective social support, was positively related to FQOL, which was consistent with the findings of many previous studies, in which social support acted as a positive factor or mediator of health outcomes, including FQOL (Balcells-Balcells, Giné, et al., 2019; Bishop-Fitzpatrick et al., 2018; Brand et al., 2016). With more subjective support, parents could express their emotions more effectively, take more effective coping measures, and improving the FQOL. In fact, there are some obstacles to improving social support in a short time frame because of limited services in psychological, rehabilitation, information and other ASD special support services (Magnusson et al., 2019). A review highlighted that parents of children with ASD used more avoidance strategies and less social support-seeking strategies than those of healthy children, which might have negative effects on parental quality of life (Vernhet et al., 2019). Since it is hard to improve social support system in a short time, it's crucial to help parents increase their utilization of social support for better satisfaction with FQOL (Zeng et al., 2020). In conclusion, future studies should focus more on how to improve parents' awareness and utilization of existing social support resources, and establish effective connections among parents and support resources, so as to improve FQOL in parents of children with ASD.

We also found that parental self-efficacy, especially parenting efficacy, is an essential protective factor of social support and FQOL. This was consistent with other studies (Luque et al., 2017; Weiss et al., 2013) and verified our theoretical hypothesis (Schwarzer & Knoll,

Table 4
Results of structural equation modelling analysis (N = 260).

Model	Point Estimate	Product of Coefficient		Bias-correct 95% CI		
		SE	*Z*	Lower	Upper	*P*
Total effects: Parental self-efficacy → Family quality of life	0.457	0.098	4.663	0.275	0.650	0.001
Direct effects: Parental self-efficacy → Family quality of life	0.292	0.108	2.704	0.087	0.506	0.009
Indirect effects: Parental self-efficacy → Social support → Family quality of life	0.165	0.069	2.391	0.058	0.343	0.003

ASD-related supports for parents of children with ASD to improve their satisfaction with FQOL.

Declaration of interest

No conflict of interest has been declared by the author(s).

Ethical considerations

All the parents signed the informed consent form. Ethical approval was approved by the Medical Ethics Committee of the Third Affiliated Hospital, Sun Yat-Sen University ([2017]2-229).

Funding statement

The work was supported by Health and Family Planning Commission of Guangdong Province [grant number A2018088].

Acknowledgments

We acknowledge the parents who spent their time to participate in this research, and the staff at the Third Affiliated Hospital of Sun Yat-Sen University and Sun Yat-Sen Memorial Hospital of Sun Yat-Sen University in Guangdong for their help and support in participant recruitment.

We acknowledge LetPub (www.letpub.com) for its linguistic assistance during the preparation of this manuscript.

References

APA, A. P. A (2013). *Diagnostic and statistical manual of mental disorders fifth edition: DSM-5.*

Balcells-Balcells, A., Gine, C., Guardia-Olmos, J., Summers, J. A., & Mas, J. M. (2019). Impact of supports and partnership on family quality of life [journal article]. *Research in Developmental Disabilities, 85*, 50–60. https://doi.org/10.1016/j.ridd.2018.10.006.

Balcells-Balcells, A., Giné, C., Guàrdia-Olmos, J., Summers, J. A., & Mas, J. M. (2019). Impact of supports and partnership on family quality of life. *Research in Developmental Disabilities, 85*, 50–60. https://doi.org/10.1016/j.ridd.2018.10.006.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review, 84*(2), 191–215.

Banik, A., Luszczynska, A., Pawlowska, I., Cieslak, R., Knoll, N., & Scholz, U. (2017). Enabling, not cultivating: Received social support and self-efficacy explain quality of life after lung cancer surgery [journal article]. *Annals of Behavioral Medicine, 51*(1), 1–12. https://doi.org/10.1007/s12160-016-9821-9.

Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. [journal article]. *Behaviour Research and Therapy, 42*(10), 1129–1148. https://doi.org/10.1016/j.brat.2003.08.008.

Bertelli, M., Bianco, A., Rossi, M., Scuticchio, D., & Brown, I. (2011). Relationship between individual quality of life and family quality of life for people with intellectual disability living in Italy [journal article]. *Journal of Intellectual Disability Research, 55*(12), 1136–1150. https://doi.org/10.1111/j.1365-2788.2011.01464.x.

Bishop-Fitzpatrick, L., Mazefsky, C. A., & Eack, S. M. (2018). The combined impact of social support and perceived stress on quality of life in adults with autism spectrum disorder and without intellectual disability [journal article; research support, N.I.H., extramural; research support, non-U.S. Gov't; research support, U.S. Gov't, non-P.H.S.]. [journal article]. *Autism, 22*(6), 703–711. https://doi.org/10.1177/1362361317703090.

Brand, C., Barry, L., & Gallagher, S. (2016). Social support mediates the association between benefit finding and quality of life in caregivers. [journal article]. *Journal of Health Psychology, 21*(6), 1126–1136. https://doi.org/10.1177/1359105314547244.

Bultas, M. W., Johnson, N. L., Burkett, K., & Reinhold, J. (2016). Translating research to practice for children with autism spectrum disorder: Part 2: Behavior management in home and health care settings. [journal article]. *Journal of Pediatric Health Care, 30*(1), 27–37. https://doi.org/10.1016/j.pedhc.2015.09.009.

Dunst, C. J., & Trivette, C. M. (1986). Mediating influences of social support: Personal, family, and child outcomes. *American Journal of Mental Deficiency, 90*(4), 403–417.

Fong, V. C., Gardiner, E., & Iarocci, G. (2020). Can a combination of mental health services and ADL therapies improve quality of life in families of children with autism spectrum disorder? [journal article]. *Quality of Life Research, 29*(8), 2161–2170. https://doi.org/10.1007/s11136-020-02440-6.

Garrido, D., Carballo, G., & Garcia-Retamero, R. (2020). Siblings of children with autism spectrum disorders: Social support and family quality of life [journal article]. *Quality of Life Research, 29*(5), 1193–1202. https://doi.org/10.1007/s11136-020-02429-1.

Gibaud-Wallston, J., & Wandersman, L. P. (1978). *Development and utility of the Parenting Sense of Competence Scale.* Toronto, Canada: Paper presented at the meeting of the American Psychological Association.

Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable [journal article]. *The British Journal of Mathematical and Statistical Psychology, 67*(3), 451–470. https://doi.org/10.1111/bmsp.12028.

Hu, X., Wang, M., & Fei, X. (2012). Family quality of life of Chinese families of children with intellectual disabilities [journal article]. *Journal of Intellectual Disability Research, 56*(1), 30–44. https://doi.org/10.1111/j.1365-2788.2011.01391.x.

Isa, S., Ishak, I., Ab, R., Nz, M., Che, D. N., Lubis, S., & Mohd, I. M. (2016). Health and quality of life among the caregivers of children with disabilities: A review of literature [journal article; review]. *Asian Journal of Psychiatry, 23*, 71–77. https://doi.org/10.1016/j.ajp.2016.07.007.

Kim, S. H., Kim, Y. S., Koh, Y. J., Lim, E. C., Kim, S. J., & Leventhal, B. L. (2016). Often asked but rarely answered: Can Asians meet DSM-5/ICD-10 autism spectrum disorder criteria? [journal article; research support, N.I.H., extramural; research support, non-U.S. Gov't]. *Journal of Child and Adolescent Psychopharmacology, 26*(9), 835–842. https://doi.org/10.1089/cap.2016.0021.

Kuru, N., & Piyal, B. (2018). Perceived social support and quality of life of parents of children with Autism [journal article]. *Nigerian Journal of Clinical Practice, 21*(9), 1182–1189. https://doi.org/10.4103/njcp.njcp_13_18.

Liu, Q., Hsieh, W. Y., & Chen, G. (2020). A systematic review and meta-analysis of parent-mediated intervention for children and adolescents with autism spectrum disorder in mainland China, Hong Kong, and Taiwan [journal article]. *Autism, 24*(8), 1960–1979. https://doi.org/10.1177/1362361320943380.

Lord, C., Elsabbagh, M., Baird, G., & Veenstra-Vanderweele, J. (2018). Autism spectrum disorder [journal article; research support, N.I.H., extramural; research support, non-U.S. Gov't; review]. *Lancet, 392*(10146), 508–520. https://doi.org/10.1016/S0140-6736(18)31129-2.

Luque, S. B., Rodríguez, V. Y., Urbieta, C. T., & Cuadrado, E. (2017). The role of coping strategies and self-efficacy as predictors of life satisfaction in a sample of parents of children with autism spectrum disorder [comparative study; journal article]. *Psicothema, 29*(1), 55–60. https://doi.org/10.7334/psicothema2016.96.

Magnusson, D., Sweeney, F., & Landry, M. (2019). Provision of rehabilitation services for children with disabilities living in low- and middle-income countries: A scoping review [journal article; review]. *Disability and Rehabilitation, 41*(7), 861–868. https://doi.org/10.1080/09638288.2017.1411982.

Marsack, C. N., & Samuel, P. S. (2017). Mediating effects of social support on quality of life for parents of adults with autism [journal article]. *Journal of Autism and Developmental Disorders, 47*(8), 2378–2389. https://doi.org/10.1007/s10803-017-3157-6.

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation [journal article; research support, N.I.H., extramural]. *Psychological Methods, 12*(1), 23–44. https://doi.org/10.1037/1082-989X.12.1.23.

Naheed, A., Islam, M. S., Hossain, S. W., Ahmed, H. U., Uddin, M., Tofail, F., ... Munir, K. (2020). Burden of major depressive disorder and quality of life among mothers of children with autism spectrum disorder in urban Bangladesh [journal article; research support, non-U.S. Gov't]. *Autism Research, 13*(2), 284–297. https://doi.org/10.1002/aur.2227.

Ngai, F. W., Wai-Chi, C. S., & Holroyd, E. (2007). Translation and validation of a Chinese version of the parenting sense of competence scale in Chinese mothers [journal article; validation study]. *Nursing Research, 56*(5), 348–354. https://doi.org/10.1097/01.NNR.0000289499.99542.94.

Noyan, E. A., Özcebe, E., & Cak, E. T. (2020). Investigation of the effect of Hanen's "more than words" on parental self-efficacy, emotional states, perceived social support, and on communication skills of children with ASD [journal article]. *Logopedics, Phoniatrics, Vocology*, 1–11. https://doi.org/10.1080/14015439.2020.1717601.

Ou, J. J., Shi, L. J., Xun, G. L., Chen, C., Wu, R. R., Luo, X. R., ... Zhao, J. P. (2015). Employment and financial burden of families with preschool children diagnosed with autism spectrum disorders in urban China: Results from a descriptive study [journal article; research support, non-U.S. Gov't]. *BMC Psychiatry, 15*, 3. https://doi.org/10.1186/s12888-015-0382-4.

Park, J., Hoffman, L., Marquis, J., Turnbull, A. P., Poston, D., Mannan, H., ... Nelson, L. L. (2003). Toward assessing family outcomes of service delivery: Validation of a family quality of life survey [journal article]. *Journal of Intellectual Disability Research, 47*(Pt 4–5), 367–384. https://doi.org/10.1046/j.1365-2788.2003.00497.x.

Poston, D., Turnbull, A., Park, J., Mannan, H., Marquis, J., & Wang, M. (2003). Family quality of life: A qualitative inquiry [journal article]. *Mental Retardation, 41*(5), 313–328 https://doi.org/10.1352/0047-6765(2003)41<313:FQOLAQ>2.0.CO;2.

Ruiz, M., Pardo, A., & Martín, R. S. (2010). Structural equation modeling. *Papeles del psicólogo-Psychologist Papers, 31*(1), 34–45.

Russell, K. M., & Ingersoll, B. (2020). Factors related to parental therapeutic self-efficacy in a parent-mediated intervention for children with autism spectrum disorder: A mixed methods study [journal article]. *Autism, 1989650329*. https://doi.org/10.1177/1362361320974233.

Schlebusch, L., Samuels, A. E., & Dada, S. (2016). South African families raising children with autism spectrum disorders: Relationship between family routines, cognitive appraisal and family quality of life. *Journal of Intellectual Disability Research, 60*(5), 412–423. https://doi.org/10.1111/jir.12292.

Schwarzer, R., & Knoll, N. (2007). Functional roles of social support within the stress and coping process: A theoretical and empirical overview. *International Journal of Psychology, 42*(4), 243–252. https://doi.org/10.1080/00207590701396641.

Toscano, C., Barros, L., Lima, A. B., Nunes, T., Carvalho, H. M., & Gaspar, J. M. (2021). Neuroinflammation in autism Spectrum disorders: Exercise as a "pharmacological" tool [journal article; review]. *Neuroscience and Biobehavioral Reviews, 129*, 63–74. https://doi.org/10.1016/j.neubiorev.2021.07.023.

Vernhet, C., Dellapiazza, F., Blanc, N., Cousson-Gélie, F., Miot, S., Roeyers, H., & Baghdadli, A. (2019). Coping strategies of parents of children with autism spectrum disorder: A systematic review [journal article; systematic review]. *European Child & Adolescent Psychiatry, 28*(6), 747–758. https://doi.org/10.1007/s00787-018-1183-3.