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ORIGINAL ARTICLE

Are we on the Same Page: a Dyadic Analysis of Parental Stress, Support, and Family Quality of Life on Raising Children with Autism Spectrum Disorders

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Abstract

Family systems are dynamic and interconnected, yet very limited research has considered both fathers' and mothers' perceptions of family support, stress and Family Quality of Life (FQOL) in a dynamic manner, especially in the Chinese context. The current study examines the association between parenting stress, FQOL and family support using a dyadic approach. We employed the actor-partner interdependence mediation model (APIMeM) to analyze a sample ($N = 219$ dyads) of Chinese fathers' and mothers' of children with autism spectrum disorder. Results suggested a strong actor effect of family support on decreasing stress and improving FQOL for mother and father respectively. However, the partner effect was largely contrasted with mothers' perceived family support and positively associated with fathers' FQOL, and fathers' perceived family support negatively associated with mothers' FQOL. There were no mediating effects of stress on partners' perceived support on FQOL. Despite being in a family system, the contrast pattern (opposite direction of the effects) between mothers and fathers suggest large discrepancies and perceptions, which may be due to different family roles and parenting involvement. Policy and practical implications are provided.

Keywords Family support · Stress · Family quality of life · Dyadic analysis

The family is a dynamic, interconnected and interacting set of relationships, both between the members of the family and with the wider society. In recent years, family quality of life (FQOL) has been regarded as one outcome indicator of measuring the

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overall family satisfaction for children with disabilities (Kyzar et al., 2016). With regard to families of children with autism spectrum disorders (ASD), mothers and fathers experience stress in parenting their children. Meanwhile, families of children with ASD are also the targets of family support programs delivered by formal professionals as well as informal resources. Despite the interconnectivity of the family, very limited research has considered how both fathers' and mothers' perceptions of family support and stress may be related to FQOL in a dynamic manner, especially in the Chinese context. Studies using descriptive analysis suggest mothers may experience significantly higher stress levels than fathers (Ang & Loh, 2019). Meanwhile, fathers reported fewer social interactions with family, friends, and health professionals than mothers (Hickey et al., 2018). A recent study (Pozo, Sarria, & Brioso, 2014) attempted to explore how fathers' and mothers' social support, and psychological well-being are related to FQOL using separate path analysis models. We propose, however, that applying the Actor Partner Interdependence Model (APIM; Kenny & Ledermann, 2010) would be better in capturing the interactive nature of parent dyads within a family system. The coefficient estimates would be more precise as APIM can control the partner effect while examining the actor effect (or vice versa). Below we synthesize the literature and highlight the significance of this study.

The Family System and Dyadic Approach

According to Bronfenbrenner' s (1979) ecological systems, and Turnbull et al. (1984) family systems theory, family is a dynamic and interconnected system, and the members are affected by each other. The family system emphasizes the interaction between fathers and mothers (Turnbull et al., 1984), and the particularly important role of co-parenting relationships within families of children with ASD has been investigated (Thullen & Bonsall, 2017). Research suggests that the fathers and mothers have interactive effects on each other as well as on the child and family outcomes. For example, Sharabi and Marom-Golan (2018) conducted a study in which they compared mothers' and fathers' involvement in family support (e.g., educational services, disability-related services, health care support) and perceptions of both formal and informal social support in Israel. They reported that significantly higher levels of maternal involvement were reported, and that maternal involvement was associated with higher levels of parental distress. Furthermore, they found the level of social support and parental education level as the contributing factors that were associated with the level of fathers' involvement. Similarly, Hartley and Schultz (2015) found mothers in their study reported a higher number of needs that were unmet than did fathers, and fathers were often more satisfied than mothers with current support services. Further analysis suggests child age, co-occurring behavior problems, presence of an intellectual disability, parent education, and household income were associated with mothers' and fathers' different support needs. Researchers also found that fathers with low socioeconomic status perceived more basic and immediate support needs. In another study by Pozo and colleagues (2014), they reported other contributing factors (e.g., problem behaviors) on fathers' and mothers' discrepancy of coping with children with disabilities .

Family systems are dynamic and interconnected systems, in which one family member (e.g., emotions and behaviors) is affected by other family members

(Bronfenbrenner, 1979; Nelson et al. 2009; Turnbull et al., 1984). For instance, studies by Hastings et al. (2005) and Kayfitz et al. (2010) found fathers' level of stress with children with ASD is strongly associated with mothers' stress level. One parent's failure to cope with their emotions may influence the relationships between the other parent and the child (Rodriguez et al., 2019). Parenting stress may be decreased by couples sharing the responsibilities of child caring, and giving more support to each other (Abidin & Brunner, 1995). Family members' needs are also more likely to be met through couples sharing the demands and needs of children with disabilities, which may contribute to improved FQOL (Davis & Gavidia-Payne, 2009).

In China, although historically mothers have been the primary caregivers of children with disabilities and the participants in research on children with disabilities, fathers are increasingly included in research on children with disabilities (Huang et al., 2012). Additionally, research has indicated the particularly important involvement of fathers and the role of co-parenting a child with ASD (Hu et al., 2019). However, collecting data from one individual family member and using it to study the entire family unit is problematic, because the conclusions drawn at the family level using the data collected from one individual family member might not be accurate. Therefore, it is imperative to involve both parents in research on FQOL of children with ASD in China.

FQOL and Children with ASD

FQOL refers to "a dynamic sense of well-being of the overall family unit, collectively and subjectively defined and informed by its members, in which individual and family level needs interact" (Zuna et al., 2010, p. 262). FQOL was grounded on the family system approach and emphasizes measuring the holistic outcome of family life for children with disabilities. In the past two decades, there has been an exponential increase in international disability research focusing on FQOL of children with disabilities (e.g., Pozo, Sarriá, & Brioso, 2014; Schlebusch et al., 2017). The overarching purpose of promoting FQOL research is to shift the focus of family support or services from the child with disabilities to the whole family as the target (Turnbull et al., 2007). Currently, FQOL has been identified by service providers and researchers internationally as one key factor and outcome measure for family and disability-related services, therefore leading to enhanced service delivery and policy development (Kober and Eggleton, 2005; Kyzar et al., 2016), because the family is the primary setting in which most children and adults with disabilities reside.

Families of children with ASD experience daunting challenges and daily high workload in parenting their children (Davis & Carter, 2008; Hu et al., 2019), given that the core deficits of ASD include social communication skill deficits, restricted interests and repetitive behaviors (American Psychiatric Association, 2013). Examining the outcomes of children with ASD and their families' experiences is important for the broader fields of social welfare and disability-related services. Previous research has primarily focused on exploring the overall FQOL of families who have children with ASD, as well as the possible predictors. In a study of Turkish parents with intellectual disabilities and ASD, Meral et al. (2013) indicated that high emotional support predicted better FQOL. Pozo and his colleagues (2014) found mild ASD symptoms and better social skills are related to better FQOL. Although FQOL studies advocate for examining perceptions from both mothers and fathers for other well-being outcomes such as family functioning and family coping, scant research has fully addressed how mothers and fathers differ in their perception towards this holistic measure of family life (Wang et al., 2004). Moreover, there might be some dynamic interactions in their perceptions towards FQOL, due to the fact that emotions and attitudes from the spousal relationship within a family might transfer directly to each other (Hu et al., 2019).

Although relatively small in quantity, research outside the United States has demonstrated that families of children with ASD reported lower levels of satisfaction in their family lives. The number of Chinese children with ASD has been increasing dramatically with an estimated prevalence of ASD as 1 per 100 in 2019 comparing to 1 per 1000 in 2006 (Sun et al., 2019). This means 1% of the total population or approximately 13 million people are diagnosed with ASD. According to a national report from the government agency of disability-related affairs, over 90% of Chinese families of children with ASD reported not experiencing satisfying family lives and low FQOL (China Association of Persons with Psychiatric Disability & their Relatives, 2014). In a recent study conducted in Mainland China, Zeng and colleagues (2019) found that Chinese families with ASD perceived a moderate to low level of FQOL. Clark et al. (2019) also suggest that Chinese families with ASD experience high levels of parenting stress and financial burden, as well as limited family support.

Family Support and FQOL

The perception of family support is one critical factor for families of children with disabilities and their satisfaction with their FQOL (Md-Sidin et al., 2010; Meral et al., 2013). Family support means a set of strategies directed to the family unit with the overarching purpose to benefit the family member with disabilities (Hecht et al., 2011). More specifically, numerous studies have suggested four primary types of family support strongly associated with FQOL: emotional support, psychological support, material/instrumental support, and informational support (e.g., Kyzar et al., 2012, 2016; Meral et al., 2013; Summers et al., 2007; Wang et al., 2004; Zeng et al., 2020). Some studies utilized sources of support (i.e., informal and formal) to conceptualize family support and found informal support from grandmothers had a positive impact on the FQOL for children with disabilities (Kresak et al., 2014).

In China, there are no authorized formal family support programs or policies delivered by the government. Furthermore, school-aged children with ASD are enrolled in special education schools for children with intellectual disabilities, ASD, and multiple disabilities. According to the education laws of China, the special education school is the primary education placement for children with ASD and the professionals from school have the responsibility to provide necessary counseling and support to family members with children with ASD (An et al., 2018). A national survey from grassroots agencies demonstrated the primary family supports adopted by Chinese families of children with ASD were mostly informal family support, ranging from counseling services to local parent support groups, professional support on parenting skills from special education schools, and emotional support as well as information sharing from self-organized parent-to-parent support groups (Clark et al., 2019). In line with these findings, Zeng et al. (2020) found that family support for children with ASD in China executed a direct positive predicting effect on FQOL and an indirect effect on FQOL through parental stress. In the study of Zeng et al. (2020), family support was measured specifically from five typologies (i.e., emotional support, material support, information support, respite care and disability-related services by professionals).

FQOL and Parenting Stress

Parenting stress is defined as the experiences of distress or discomfort associated with the role of being a parent (Deater-Deckard, 1998). Due to the core symptoms of ASD (e.g., social interaction deficits, repetitive behaviors, and restricted interests and activities), parents raising children with ASD experience more mental health issues and more parenting stress than parents with typically developing children or children with other disabilities (Brei et al., 2015; Gardiner & Iarocci, 2014). Particularly, among families of children with ASD compared to families of children without disabilities or with other types of disabilities, child challenging behaviors are highly predictive of parent stress (Falk et al. 2014). These challenging behaviors include self-injury behaviors, social interaction difficulties, and emotional dysregulations.

Parenting stress has a lasting impact on the overall FQOL for children with ASD. Specifically, research has indicated that parents of children with ASD experience higher levels of stress and lower levels of quality of life (Lee et al., 2008). Higher parenting stress leads to the parents feel less able to seek essential support for their children, which has an impact on FQOL (Pozo, Sarriá, & Brioso, 2014). Therefore, as one holistic assessment of family satisfaction, FQOL has be viewed as a significant outcome of the impact of parenting stress on families of children with ASD (Meral et al., 2013).

However, these studies only focused on the parenting stress and perceptions of one of the parents in the family on their FQOL (Pozo, Sarriá, & Brioso, 2014; Lee et al., 2008). Very limited research has considered both fathers' and mothers' perceptions of parent stress and FQOL in a dynamic manner. Therefore, the purpose of the current study is to investigate the association between parenting stress, FQOL and family support using a dyadic approach for mothers and fathers of children with ASD. Based on the above-mentioned international theoretical and unique foundations, this study is among the first to examine whether the parenting stress of Chinese fathers and mothers of children with ASD mediates the relationship between their perception of family support and their overall FQOL. Specifically, we want to address the following three questions: (1) Is mothers' perceived family support associated with their FQOL and mediated by perceived stress for mothers/fathers of children with ASD? (2) Is fathers' perceived family support associated with their FQOL and mediated by perceived stress for mothers/fathers of children with ASD? (3) Is fathers' and mothers' FQOL impacted by their partners' perceived support and stress for mothers/fathers of children with ASD? The first and second questions were addressed by the actor effect results and the third question would be addressed by the partner effect analysis. It was expected that parents with better support will report higher FQOL themselves and may reduce stress (i.e., actor effect). We also expected that FQOL would be impacted by their partners' perceived support and stress (i.e., partner effect).

Method

Sampling Procedure

Because obtaining lists of families of children with ASD across China was not feasible for this study, we opted to recruit participants through local school networks in China. We first contacted 21 public special education school serving children with ASD aged 7–18 in Mainland China. Although different regions' special education policies may differ, parents of children with ASD may receive some level of support from the local government and non-government organizations (NGOs). Also, they may utilize their social network and online resources to seek information and support. Fifteen out of the 21 schools expressed interest to participate in the research (seven in urban and eight in rural areas). Direct mailing of stamped envelopes with return postage were sent to parents of children with ASD. Thisxt method helped ensure confidentiality by removing school personnel from the process. Participating in this study required the parents to have a child diagnosed with ASD by a certified doctor according to the DSM-IV-TR criteria (American Psychiatric Association, 2000). Although the ASD diagnosis is based on parent self-report, a clinician's report was required for the child to be enrolled in the public special education schools. The father and mother of the child with ASD filled out the same set of survey questions individually. No incentive was provided to families to complete the survey.

Participants

We sent the survey to a total of 259 parents and received 226 pairs of response with the response rate of 87%. Within the sample, one couple was unmarried, two were divorced, and four were widows (their partners' responses were blank). We excluded these seven pairs of data as they were not able to provide both parents' responses for dyadic analysis. A total of 438 parents including 219 mothers ($M = 39.3$ years, $SD = 4.4$) and 219 fathers ($M = 42.0$, $SD = 5.4$) of children aged 7–12 years ($M = 10.3$, $SD = 3.0$) were included in the final sample. Among the 219 families, 37.2% of them were below the poverty level with a monthly income of less than 4000 Chinese yuan ($570). Out of the 219 mothers, a little less than half (49.4%) of them had a bachelor degree or above compared to 52.1% of fathers. The rest of the parents had high school or lower degrees. About 88% of the fathers were employed for either part-time or full-time compared to 53% of mothers. The additional demographic information for children and their parents is provided in Table 1.

Measures

We used four instruments to collect dyadic data: Family Support Scale for Chinese Children with ASD, The Parenting Stress Inventory-Short Form (PSI-SF), Beach Center Family Quality of Life Scale, and a Demographic Family Information Form.

Family Support Scale for Chinese Children with ASD To better examine the typologies of family support available in China, we utilized The Family Support Scale for Chinese Children with ASD, which was developed by the Research Center of Children with ASD, Beijing Normal University. This scale is used to examine Chinese families' levels of

Table 1 Participant Descriptive Statistics

	n	%	*M*	*SD*
Child				
Gender				
Male	182	83.5		
Female	36	16.5		
Age			10.3	3.0
Family Income				
< 4 k	80	37.2		
4-8 k	68	37.1		
8-20 k	49	22.8		
>20 k	18	8.4		
Mother				
Age			39.3	4.4
Education				
Master or above	17	7.8		
Bachelor	91	41.6		
High school	59	26.9		
< high school	52	23.7		
Work Status				
Unemployed	103	47.0		
Part time	28	12.8		
Full time	88	40.2		
Father				
Age			42.0	5.4
Education				
Master or above	21	9.6		
Bachelor	93	42.5		
High school	52	24.2		
< high school	53	24.2		
Work Status				
Unemployed	27	12.4		
Part time	31	14.3		
Full time	159	73.3		

perceived types of support for children with ASD in China with higher total scores meaning better perceptions. Sample items included "I receive information about parenting young children with autism"; "My local government provides social benefits to my child"; and "The school or local agencies provide early intervention for my child." When filling out the scale, they were asked to think of the support received based on their past experiences. The response choice is a 5-point Likert form and contains 36 items (1 = none, 5 = always). The scale has five factors (Emotional Support = 6 items, Material Support = 6 items, Information Support = 7 items, Professional Support = 6 items, and

Respite Care = 5 items). The Cronbach's α for the total scale was .89, and the domains range from .88 to .93. Split-half reliability coefficients range from .82 to .90 for the domains and .83 for the total scale. The test-retest reliability coefficients range from .89 to .94 for the Family Support Scale's domains (Zhou et al., 2018).

The Parenting Stress Inventory-Short Form (PSI-SF) The questionnaire of PSI-SF contains 36 items using a 1- to 5-point Likert scale form (1 = strongly agree, 5 = strongly disagree) to examine the parenting stress of parents with children with ASD. The PSI-SF consists of three subscales: Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child subscale. The higher scores indicate higher levels of parenting stress. The original scale has been well established and widely used (Abidin, 1995). The Chinese version of the PSI-SF also revealed good reliability and validity (Pearson & Chan, 1993). The internal consistency of the Chinese version for the current study was .90 with the three subscales at .92, .89. and .90 respectively. When constructing the model, we used all three scales as the observed variables to measure the latent "parenting stress" construct.

Beach Center Family Quality of Life Scale The Beach Center FQOL Scale is an instrument developed to investigate the overall quality of family of children with disabilities. It comprises five domains regarding families' perception of their satisfaction with their FQOL. In terms of psychometric properties, this scale includes a total of 25 items (Cronbach's α = .94) grouped into five domains: Family Interaction (six items, Cronbach's α = .92), Parenting (six items, Cronbach's α = .88), Emotional Well-Being (four items, Cronbach's α =0.80), Physical/Material Well-Being (five items, Cronbach's α = .88) and Disability-Related Support (four items, Cronbach's α = .92). Since the purpose of this study was to examine the relationship between family outcomes (i.e., FQOL) with family support, the four Disability-related Services items were removed. This 21-item version has been used in studies on families of children with disabilities in a Taiwanese sample (Chiu et al., 2013) and 556 parents of kindergartners without disability in the U.S. (Zuna et al., 2009). This 21-item instrument used a 5-point Likert-type response scale ranging from 1 (dissatisfied) to 5 (very satisfied) on families' indication of levels of satisfaction. Results of the CFA on 333 parents with disabilities in Taiwan indicated adequate fit to the four-factor structure, $\chi2(179) = 663.41$, $p < .001$, CFI = .98, and RMSEA = .085 (Chiu et al., 2013). In the current study, we used the Chinese version of the Beach Center FQOL Scale which has been widely used in research with Chinese families (Hu et al., 2012; Hu, 2016).

Demographic Family Information Form This form included questions to gather information of respondents (i.e., gender, age, employment status, relationship to the child, marital status, educational level, geographical location, family structure, household income, additional support at home) and their children with disabilities (i.e., gender, date of birth, severity of disability).

Data Analysis

First, we conducted descriptive statistics and correlational analyses to examine the dyadic outcomes of interest. For missing values, the missing rates ranged from 2.1–

4.6%. We conducted the Little (1988)'s Missing Completely At Random (MCAR) test and results suggested the data were missing completely at random ($\chi^2 = 466.15$, $df = 506$, $p = .897$). We used the expectation maximization technique to impute the missing values. Then, we used the Actor Partner Interdependence Model (APIM; Kenny & Ledermann, 2010) to examine the dyadic effect. APIM is a powerful model that can disentangle an individual-level effect (called actor effects) from a partner effect. Specifically, the APIM can estimate how the independent variable of a person influences his or her score on the dependent variable (i.e., actor effect). It can also evaluate the extent to which the independent variable of a person influences the dependent variable of his or her partner (i.e., partner effect). An extension of APIM, the actor-partner interdependence mediation model (APIMeM) for distinguishable dyads (Ledermann et al., 2011) was conducted to examine the effect of family support (predictor variable) on FQOL (outcome variable) through parental stress (mediating variable).

In the APIMeM, the effect of family support on parental stress is designated as *a*, the effect of parental stress on FQOL is designated as *b*, and the effect of family support on FQOL is designated as *c*. Then, the direct effects (a, b & c), the mediating or indirect effects (ab) and the total effects (ab+c) were computed for both the actor and partner effects. APIMeM analysis was conducted using R programming (R core team, 2004) with the *sem* function from *lavaan* (Rosseel, 2012) and plot the SEM graph with the *semPlot* (Epskamp, 2014) packages. We created a structural equation model to specify the individual actor effect and how partners' perceived support and stress may be related to actors' FQOL. In addition, we added two correlations between the independent variables and correlations between the outcome variables. Thus, actor effects are estimated controlling for partner effects, and partner effects are estimated controlling for actor effects (Cook & Kenny, 2005). Model estimates were conducted by following the maximum likelihood technique as the data were normally distributed (Kline, 2015). We used a cut off value of greater than 0.40 as an indicator of appropriate loading parameter estimate (Matsunaga, 2010). We used the four common APIM patterns (i.e., actor only, partner only, couple pattern, and social comparison pattern; Kenny & Cook, 1999) to interpret the findings.

Results

The descriptive statistics (Table 1) shows that the scores for mother and father variables followed a normal distribution with the kurtosis and skewness values ranging from absolute .001 to 4.44 (Lei & Lomax, 2005). We examined the bivariate correlations using Pearson's *r* between dyadic pairs of variables values. The significant correlations (Table 2) between the subscale variables for mothers and fathers confirmed the nonindependence and provided support for the decision of using the dyadic approach in the current study.

We employed the APIMeM to test the associations (family support, parenting stress and FQOL) across dyads. The initial model fit indices were less than ideal, with $\chi 2 = 5493$, $df = 237$, $p < .001$, CFI = .738, RMSEA = .131, SRMR = .081. We used the *modification indices* function to see if the machine proposed additional changes that would further improve the model. The output suggested adding a number of covariates

Table 2 Zero-order Correlation of the Constructs

	1	2	3	4	5	6	7	8	9	10	11	12
M_FS_ES	1											
M_FS_MS	.367**	1										
M_FS_IS	.641**	.524**	1									
M_FS_PS	.506**	.551**	.662**	1								
M_FS_RS	.358**	.499**	.463**	.547**	1							
F_FS_MS	.509**	.234**	.447**	.461**	.262**	1						
F_FS_MS	.212**	.590**	.355**	.392**	.424**	.429**	1					
F_FS_IS	.355**	.357**	.557**	.459**	.323**	.726**	.566**	1				
F_FS_PS	.319**	.397**	.425**	.684**	.396**	.637**	.567**	.678**	1			
F_FS_RS	.209**	.407**	.312**	.390**	.636**	.408**	.587**	.489**	.576**	1		
M_PSI_DS	−.145*	.025	−.062	.039	−.087	−.072	−.047	−.021	−.052	−.109	1	
M_PSI_CDI	−.339**	−.084	−.199**	−.145*	−.157*	−.205**	−.062	−.154*	−.204**	−.176*	.487**	1
M_PSI PD	−.371**	−.125	−.181**	−.198**	−.233**	−.335**	−.090	−.211**	−.255**	−.180**	.401**	.597**
F_PSI_PD	−.146*	−.036	−.090	−.107	−.101	−.278**	−.007	−.230**	−.251**	−.166*	.289**	.400**
F_PSI _CDI	−.156*	−.025	−.078	−.032	−.021	−.297**	−.066	−.250**	−.222**	−.137	.235**	.557**
F_PSI_DC	−.197**	−.014	−.054	.034	−.004	−.146*	−.082	−.101	−.093	−.090	.527**	.385**
M_FQOL_I	.484**	.151*	.392**	.299**	.278**	.309**	.013	.188**	.109	.073	−.221**	−.250**
M_FQOL_P	.492**	.204**	.431**	.377**	.363**	.375**	.151*	.267**	.219**	.185**	−.285**	−.260**
M_FQOL_EH	.463**	.229**	.414**	.412**	.355**	.454**	.141*	.272**	.311**	.213**	−.253**	−.251**
M_FQOL_PH	.356**	.242**	.353**	.306**	.384**	.326**	.296**	.246**	.269**	.230**	−.203**	−.151*
F_FQOL_I	.292**	.073	.282**	.188**	.130	.521**	.125	.372**	.249**	.119	−.154*	−.182*
F_FQOL_P	.308**	.150*	.349**	.314**	.239**	.516**	.230**	.435**	.396**	.237**	−.146*	−.245**
F_FQOL_EH	.242**	.094	.234**	.282**	.272**	.501**	.252**	.366**	.376**	.263**	−.183**	−.229**

Table 2 (continued)

	1	2	3	4	5	6	7	8	9	10	11	12
F_FQOL_PH	.163*	.165*	.212**	.241**	.220**	.426**	.317**	.360**	.328**	.292**	−.129	−.090

	13	14	15	16	17	18	19	20	21	22	23	24
M_FS_ES												
M_FS_MS												
M_FS_IS												
M_FS_PS												
M_FS_RS												
F_FS_MS												
F_FS_MS												
F_FS_IS												
F_FS_PS												
F_FS_RS												
M_PSI_DS												
M_PSI_CDI												
M_PSI PD	1											
F_PSI_PD	.443**	1										
F_PSI _CDI	.277**	.566**	1									
F_PSI_DC	.293**	.482**	.591**									
M_FQOL_I	−.337**	−.220**	−.131	−.145*	1							
M_FQOL_P	−.301**	−.251**	−.217**	−.224**	.768**	1						
M_FQOL_EH	−.363**	−.310**	−.273**	−.190**	.635**	.706**	1					
M_FQOL_PH	−.252**	−.158*	−.163*	−.120	.490**	.538**	.502**	1				

Table 2 (continued)

	13	14	15	16	17	18	19	20	21	22	23	24
F_FQOL_I	−.273**	−.304**	−.175*	−.091	.506**	.410**	.427**	.342**	1			
F_FQOL_P	−.256**	−.366**	−.360**	−.194**	.442**	.508**	.487**	.378**	.699**	1		
F_FQOL_EH	−.359**	−.405**	−.268**	−.255**	.432**	.483**	.600**	.437**	.605**	.738**	1	
F_FQOL_PH	−.221**	−.267**	−.222**	−.113	.260**	.308**	.343**	.670**	.503**	.548**	.523**	1

Note: M_FS_ES = Mother_Family Support_Emotioanl Support; M_FS_MS = Mother_Family Support_Material Support; M_FS_IS = Mother_Family Support_Informational Support; M_FS_PS = Mother_Family Support_Professional Support; M_FS_RS = Mother_Family Support_Respite Support; F_FS_ES = Father_Family Support_Emotional Support; F_FS_MS = Father_Family Support_Materials Support; F_FS_IS = Father_Family Support_Informational Support; F_FS_PS = Father_Family Support_Professional Support; F_FS_RS = Father_Family Support_Respite Support; M_PSI_DC = Mother_Parental Stress Inventory_Difficult Child; M_PSI_CDI = Mother_Parental Stress Inventory_Difficult Child; M_PSI_PD = Mother_Parental Stress Inventory_Parental Distress; F_PSI_PD = Father_Parental Stress Inventory_Parental Distress; F_PSI_CDI = Father_Parental Stress Inventory_Difficult Child; F_PSI_DC = Father_Parental Stress Inventory_Difficult Child; M_FQOL_I = Mother_Family Quality of Life_Interaction; M_FQOL_P = Mother_Family Quality of Life_Parenting; M_FQOL_EH = Mother_Family Quality of Life_Emotional Health; M_FQOL_PH = Mother_Family Quality of Life_Physical Health; F_FQOL_I = Father_Family Quality of Life_Interaction; F_FQOL_P = Father_Family Quality of Life_Parenting; F_FQOL_EH = Father_Family Quality of Life_Emotional Health; F_FQOL_PH = Father_Family Quality of Life_Physical Health;

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 3 Actor-partner Interdependence Mediation Model with Mothers and Fathers' Perceived Family Support as Predictors, Parenting Stress as Mediators, and Mothers and Fathers' Perceptions of Family Quality of Life as Outcome Variables

Effect	*B*	*β*	*SE*	*p*
Actor Effect				
Support_M----FQOL_M	0.948	0.602	0.083	< .001
Stress_M----FQOL_M	−0.317	−0.184	0.059	< .001
Support_M---Stress_M	−0.203	−0.223	0.041	< .001
Total effect	1.012	0.650		
Support_F----FQOL_F	0.263	0.254	0.041	< .001
Stress_F----FQOL_F	−0.396	−0.376	0.044	< .001
Support_F---Stress_F	−0.510	−0.508	0.052	< .001
Total effect	0.465	0.444		
Partner Effect				
Support_F---FOQL_M	−0.497	−0.440	0.047	< .001
Stress_F---FQOL_M	−0.090	−0.081	0.042	.033
Support_F--- Stress_M	0.042	0.064	0.031	.158
Total effect	−0.535	−0.446		
Support_M---FOQL_F	0.251	0.173	0.060	< .001
Stress_M---FQOL_F	−0.036	−0.022	0.063	.570
Support_M--- Stress_F	0.343	0.247	0.068	< .001
Total effect	0.239	0.169		
Correlation				
Support_M---Support_F	0.497	0.687	0.037	< .001
FQOL_M---FQOL_F	0.529	0.492	0.036	< .001
Stress_M---Stress_F	0.397	0.606	0.034	< .001

Note. FQOL = Family Quality of Life; F = Father; M = Mother

for the subscales. We believed this output suggests that the constructs are inherently related to each other. Thus, we added additional covariates at the subscale level. The model fit indices suggested the revised model is adequate with $\chi2 = 1342$, df = 216, $p < .001$, CFI = .911, RMSEA = .080, SRMR = .057. The range of standardized loadings of each latent variable and the observed scales were: .65–.83 for Mother reported family support, .60–.90 for Mother reported FQOL, and .74–.79 for Mother reported parental stress; .65–.85 for Father reported family support, .59–.91 for Father reported FQOL, and .67–.79 for Father reported parental stress. All of the loadings exceeded the cutoff of 0.40, indicating that the latent variables were adequately measured by observed subscales. The actor effect below address the first two research questions, and the partner effect result is related to the third research question.

Perceived Family Support, Stress, and their Own FQOL

The direct effect of mothers' perceptions of family support on their own perceptions of FQOL emerged as a significant actor effect for mothers ($\beta = 0.602, p < .001$) as shown in Table 3, indicating that mothers' perceptions of family support was positively associated with their own perceptions of FQOL. Meanwhile, the relationship between family support and FQOL is mediated by mother stress. Specifically, for every unit of family support increase, mother stress decreases by 0.223 standardized coefficient ($p < .001$), and mothers' stress was negatively associated with FQOL ($\beta = -0.184$, $p < .001$). The indirect (mediating) effect of mothers' stress on family support and FQOL was 0.04 (−0.223–0.184). Together, the total effect of family support on FQOL is 0.650 for mothers of children with ASD.

Similarly, the direct effect of fathers' perceptions of family support on their own perceptions of FQOL emerged as a significant actor effect ($\beta = 0.254$, $p < .001$). Meanwhile, the relationship between family support and FQOL is mediated by father stress. Specifically, for every unit of family support increase, parental stress decreases by 0.510 standardized coefficient ($p < .001$), and father stress was negatively associated with FQOL ($\beta = -0.376$, $p < .001$). The indirect (mediating) effect of father stress on family support and FQOL was 0.192 (−0.510–0.376). Together, the total effect of family support on FQOL is 0.444 for fathers of children with ASD.

Perceived Family Support, Stress, and their Partner's FQOL

We observed significant partner effects of mothers' perceived support on fathers' FQOL ($\beta = 0.173$, $p < .001$) as presented in Table 3. Meanwhile, the partner effect of mothers' perceptions of family support on paternal stress was statistically significant ($\beta = 0.247$, $p < .001$). However, there was no significant relationship between mothers' stress on fathers' FQOL ($\beta = -0.022$, $p = .570$). Together, the total effect of mothers' perceived support on fathers' FQOL was 0.169.

Interestingly, the partner effect of fathers' perceptions of family support on mothers' perceptions of family quality of life was negatively statistically significant ($\beta = -0.440$, $p < .001$). Also the partner effect of fathers' perceptions of family support on maternal stress was not statistically significant ($\beta = 0.064$, $p = .158$). The partner effect of fathers' stress on mothers' FQOL was not statistically significant ($\beta = -0.081$, $p = .033$).

Discussion

This study elucidated family systems theory that posited that interconnected relationships and perceptions of mothers and fathers could result in unique patterns of family support effects on stress and FQOL in the Chinese context. The current study is the first one to examine the association between parenting stress, FQOL and family support using a dyadic approach. The findings contribute to a deeper understanding of the dyadic interaction between fathers and mothers of children with ASD and may inform family-centered interventions to better support their family outcomes.

First, results suggest a strong actor effect of family support on decreasing stress and improving FQOL for both mothers (total effect = 0.650) and fathers (total effect = 0.444) respectively. A previous study (Zeng et al., 2020) suggests family support has positive association in promoting FQOL and helps to buffer the negative effects of stress deriving from raising a child with ASD. Our study further validates this claim and indicates that both mothers and fathers may benefit from a strong family support system. While previous studies suggest raising a child with ASD can be stressful for both fathers and mothers (Harper, Dyches, Harper, Roper, & South, 2013; Rivard et al., 2014), if robust family support is available to meet the demands associated with parenting a child with ASD, it may not only alleviate parental stress, but may also change their perception of FQOL (Abidin, 1990).

Despite being in a family system, however, we observe different actor-partner patterns. When considering fathers as the actor and mothers as the partner, fathers' FQOL are positively associated with fathers' perceived support and mothers' perceived support. This is a defined as the couple pattern (Kenny & Cook, 1999). That is, fathers' FQOL (*Y*) is associated with as much by his own perceived support (*X*) as with their partners' perceived support (*X'*). This would occur if the person were as concerned with the partner's outcomes as with his or her own outcomes (Kenny & Cook, 1999). In other words, mothers' perceived support may accurately represent fathers' priority in family support. Mothers may know better in terms of the family needs and priority since the parenting responsibility largely fall on the mother's side (Johnson & Simpson, 2013) due to traditional Chinese beliefs and community values (Tait et al., 2018).

In contrast, when considering mothers as the actor and fathers as the partner, mothers' FQOL are positively associated with their own perceived support but negatively associated with fathers' perceived support. This is a defined as the contrast pattern (Kenny & Cook, 1999). In contrast to the couple-oriented case, where the partner's success is valued as much as one's own outcome, the contrast social comparison typically involves dissatisfaction with the partner's success. In other words, what the father perceived as the priority for family support may not accurately represent mothers' perceived priority and preferences. This discrepancy may reflect the traditional family roles. Specifically, this finding may reflect that fathers are not as involved as mothers in daily caregiving for the child with ASD. The level of services needed and specific types of support that fathers perceive as highly valuable may not be valued equally by mothers (Wang & Michaels, 2009). Yet research has shown that fathers' involvement is essential to promote mutual support (Flippin & Crais, 2011). Therefore, it is important to use a family-centered approach and involve both fathers and mothers in the support plan and implementation process. Meanwhile, the contrast pattern (opposite direction of the effects) suggest large discrepancies in perception, which may be a source of family conflict (Hu, 2020).

A number of limitations exist in the study. First, the constructs are conceptualized as latent variables measured by multiple dimensions, and we are focusing on the dyadic effect at the latent variable level. It is not known how all of the specific dimensions may be related to each other. Second, while we attempted to recruit a diverse sample across mainland China, there was no way to verify the sample's representation as no national registry or census is available at this time. Third, the study is limited to only families of children with ASD that enrolled in special education schools. Children under five years old or adults with ASD are not included. Generalization to the larger ASD population should be cautious. Fourth, the dataset is cross-sectional in nature and causal claims cannot be made. Future studies should look at a longitudinal study design to examine the dyadic effect of family support on parental stress and FQOL. Fifth, we did not include covariates (e.g., child severity and family poverty level) in the model and there might be subgroup differences.

Implications

Several important conclusions and practical implications can be derived from the study. First, a systematic family support network should be provided for both mothers and fathers to enhance the overall FQOL. Findings of our study indicate that family support adequacy can significantly predict FQOL for Chinese families of children with ASD. In China, the local government in charge of affairs for children with ASD (i.e., local association for people with disabilities) should provide formal family-centered services (i.e., information support; professional support, respite care) to prepare families in responding to stress and build resilience (Hu et al., 2019). The possible programs can include weekend respite care services, psychological counseling, mental health services, and information support on education and healthcare services for children with ASD. Indeed, in some big city areas of China, the local government has provided respite care and parent-to-parent programs for families with ASD and found promising effects in reducing parental stress (China Association of Persons with Psychiatric Disability & Their Relatives, 2014). Furthermore, informal support (i.e., emotional support, parent to parent groups, respite care) have been documented as one cost-effective and efficient way to help families deal with parenting challenges and meet the health care needs, as well as problem behaviors of children with ASD (McCabe, 2008).With regard to developing informal support, government and NGO could design and provide parent to parent programs, hotline services, and home visits by relatives or community members to families of children with ASD. Moreover, support providers should assist parents realizing the potential benefits in seeking support outside from family members. Community members, friends, and relatives are sources of informal support and exerting positive role in providing emotional support.

Second, the partner-level pathway analysis demonstrates a contrast or contradicting pattern. These findings indicate discrepancy in fathers' and mothers' perceived priority and support needed to improve their FQOL. On one hand, more services should be devoted to supporting fathers' involvement in parenting children with ASD. Also, it is important to promote mutual communication and shared understanding for the couples through marriage consultation or other services. Diverse support should be available for both fathers and mothers to choose since they shoulder different roles in parenting children with ASD. Exploring needs from both fathers and mothers will be helpful for support providers to design and develop individualized family support and services. Moreover, as parent-delivered interventions become pervasive in China (Clark et al., 2019), practitioners should take the distinct needs and benefits of in-home interventions from fathers and mothers into careful consideration, respectively. Also, it is important to involve both fathers and mothers in the support plan and implementation process.

There are several additional studies and analyses that would extend this work. First, it would be important to explore how the dyadic pattern we identified in this paper differs based on the life course of families of individual with autism, as well as the autism severity. Furthermore, it is important to extend research on marital relationships, effective communication, and mental health of parents of children with ASD. Understanding how to develop a robust family support system is essential to promote family resilience and FQOL. In particular, we need to conduct more implementation research and adapt evidence-based practices to the local context and value parents' input and family culture. Future research should seek to understand specific indicators of needs that fathers and mothers consider important in defining high-quality family support for their children with ASD. Additionally, given our findings that family support has the potential to buffer the negative effects of low parenting stress, this line of research could be further informed by examining other possible factors, such as family-professional partnership and educational services available to children with ASD (Kyzar et al., 2016). To better understand the nature of family support' impacts on FQOL, research should examine the effects of specific support indicators (including formal and informal support, types of support providers) on each of the FOQL domains for families of children with ASD. Unpacking the relationship between family support and FQOL for families of children with ASD is a logical next step in this line of research.

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Compliance with Ethical Standards

Conflict of Interest The authors declare no conflict of interest.

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

Informed Consent Informed consent was obtained from all parents (including mothers and fathers) included in the study.

References

Abidin, R. R. (1990). Introduction to the special issue: The stresses of parenting. *Journal of Clinical Child Psychology, 19*(4), 298–301.

Abidin, R. R. (1995). *Manual for the parenting stress index*. Odessa, FL: Psychological Assessment Resources.

Abidin, R., & Brunner, J. (1995). Development of a parenting alliance inventory. *Journal of Clinical Child Psychology, 24*(1), 31–40.

An, Z. G., Hu, X. Y., & Horn, E. (2018). Chinese inclusive education: The past, present, and future. *Intervention in School and Clinic, 54*, 118–122.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Revision). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Association.

Ang, K. Q. P., & Loh, P. R. (2019). Mental health and coping in parents of children with autism Spectrum disorder (ASD) in Singapore: An examination of gender role in caring. *Journal of Autism and Developmental Disorders, 49*(5), 2129–2145.

Brei, N. G., Schwarz, G. N., & Klein-Tasman, B. P. (2015). Predictors of parenting stress in children referred for an autism spectrum disorder diagnostic evaluation. *Journal of Developmental and Physical Disabilities, 27*(5), 617–635.

Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.

Chiu, C. Y., Turnbull, A. P., & Summers, J. A. (2013). What families need: Validation of the family needs assessment for Taiwanese families of children with intellectual disability and developmental delay. *Research and Practice for Persons with Severe Disabilities, 38*(4), 247–258.

Clark, E., Zhou, Z., & Du, L. (2019). Autism in China: Progress and challenges in addressing the needs of children and families. *International Journal of School & Educational Psychology, 7*(2), 135–146.

Cook, W. L., & Kenny, D. A. (2005). The actor–partner interdependence model: A model of bidirectional effects in developmental studies. *International Journal of Behavioral Development, 29*(2), 101–109.

Davis, K., & Gavidia-Payne, S. (2009). The impact of child, family, and professional support characteristics on the quality of life in families of young children with disabilities. *Journal of Intellectual and Developmental Disability, 34*(2), 153–162.

Davis, N. O., & Carter, A. S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders, 38*(7), 1278–1291.

Deater-Deckard, K. (1998). Parenting stress and child adjustment: Some old hypotheses and new questions. *Clinical Psychology: Science and Practice, 5*(3), 314–332.

Epskamp, S. (2014). semPlot: Path diagrams and visual analysis of various SEM packages' output (Version 1.0.0).

Falk, N. H., Norris, K., & Quinn, M. G. (2014). The factors predicting stress, anxiety and depression in the parents of children with autism. *Journal of Autism and Developmental Disorders, 44*, 3185–3203.

Flippin, M., & Crais, E. R. (2011). The need for more effective father involvement in early autism intervention: A systematic review and recommendations. *Journal of Early Intervention, 33*(1), 24–50.

Gardiner, E., & Iarocci, G. (2014). Students with autism spectrum disorder in the university context: Peer acceptance predicts intention to volunteer. *Journal of Autism and Developmental Disorders, 44*(5), 1008–1017.

Harper, A., Dyches, T. T., Harper, J., Roper, S. O., & South, M. (2013). Respite care, marital quality, and stress in parents of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 43*(11), 2604-2616.

Hartley, S. L., & Schultz, H. M. (2015). Support needs of fathers and mothers of children and adolescents with autism Spectrum disorder. *Journal of Autism and Developmental Disorders, 45*(6), 1636–1648.

Hastings, R. P., Kovshoff, H., Brown, T., Ward, N. J., Espinosa, F. D., & Remington, B. (2005). Coping strategies in mothers and fathers of preschool and school-aged children with autism. *Autism, 9*, 377–391.

Hecht, E., Reynolds, M., Agosta, J., McGinley, K., & Moseley, C. (2011). Building a national agenda for supporting families with a member with intellectual and developmental disabilities. *Wingspread Family Support Summit*.

Hickey, E. J., Dubois, L., & Hartley, S. L. (2018). Positive and negative social exchanges experienced by fathers and mothers of children with autism. *Autism, 22*(4), 469–478.

Hu, X., Wang, M., & Fei, X. (2012). Family quality of life of Chinese families of children with intellectual disabilities. *Journal of Intellectual Disability Research, 56*(1), 30-44.

Hu, X. (2020). Chinese fathers of children with intellectual disabilities: Their perceptions of the child and their own needs for family support. *International Journal of Developmental Disabilities*, 1–9. https://doi.org/10.1080/20473869.2020.1716565.

Hu, X., Han, Z. R., Bai, L., & Gao, M. M. (2019). The mediating role of parenting stress in the relations between parental emotion regulation and parenting behaviors in Chinese families of children with autism Spectrum disorders: A dyadic analysis. *Journal of Autism and Developmental Disorders, 49*(10), 3983–3998.

Huang, Y. P., Tsai, S. W., & Kellett, U. (2012). Fathers of children with disabilities: Encounters with health professionals in a Chinese context. *Journal of Clinical Nursing, 21*, 198–206.

Johnson, N. L., & Simpson, P. M. (2013). Lack of father involvement in research on children with autism spectrum disorder: Maternal parenting stress and family functioning. *Issues in Mental Health Nursing, 34*(4), 220–228.

Kayfitz, A. D., Gragg, M. N., & Robert Orr, R. (2010). Positive experiences of mothers and fathers of children with autism. *Journal of Applied Research in Intellectual Disabilities, 23*(4), 337–343.

Kenny, D. A., & Ledermann, T. (2010). Detecting, measuring, and testing dyadic patterns in the actor–partner interdependence model. *Journal of Family Psychology, 24*(3), 359–366.

Kenny, D. A., & Cook, W. (1999). Partner effects in relationship research: Conceptual issues, analytic difficulties, and illustrations. *Personal Relationships, 6*(4), 433–448.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York, NY: Guilford Press.

Kober, R., & Eggleton, I. R. (2005). The effect of different types of employment on quality of life. *Journal of Intellectual Disability Research, 49*(10), 756–760.

Kresak, K. E., Gallagher, P. A., & Kelly, S. J. (2014). Grandmothers raising grandchildren with disabilities: Sources of support and family quality of life. *Journal of Early Intervention, 36*, 3–17.

Kyzar, K. B., Brady, S. E., Summers, J. A., Haines, S. J., & Turnbull, A. P. (2016). Services and supports, partnership, and family quality of life: Focus on deaf-blindness. *Exceptional Children, 83*(1), 77–91.

Kyzar, K. B., Turnbull, A. P., Summers, J. A., & Gómez, V. A. (2012). The relationship of family support to family outcomes: A synthesis of key findings from research on severe disability. *Research and Practice for Persons with Severe Disabilities, 37*(1), 31–44.

Ledermann, T., Macho, S., & Kenny, D. A. (2011). Assessing mediation in dyadic data using the actor-partner interdependence model. *Structural Equation Modeling: A Multidisciplinary Journal, 18*(4), 595–612.

Lee, L.-C., Harrington, R. A., Louie, B. B., & Newschaffer, C. J. (2008). Children with autism: Quality of life and parental concerns. *Journal of Autism and Developmental Disorders, 38*(6), 1147–1160.

Lei, M., & Lomax, R. G. (2005). The effect of varying degrees of nonnormality in structural equation modeling. *Structural Equation Modeling, 12*(1), 1–27.

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198–1202.

Matsunaga, M. (2010). How to factor-analyze your data right: Do's, Don'ts, and how-To's. *International Journal of Psychological Research, 3*(1), 97–110.

McCabe, H. (2008). The importance of parent-to-parent support among families of children with autism in the People's republic of China. *International Journal of Disability, Development and Education, 55*(4), 303–314.

Md-Sidin, S., Sambasivan, M., & Ismail, I. (2010). Relationship between work-family conflict and quality of life: An investigation into the role of social support. *Journal of Managerial Psychology, 25*(1), 58–81.

Meral, B. F., Cavkaytar, A., Turnbull, A. P., & Wang, M. (2013). Family quality of life of Turkish families who have children with intellectual disabilities and autism. *Research and Practice for Persons with Severe Disabilities, 38*(4), 233–246.

Nelson, J. A., O'Brien, M., Blankson, A. N., Calkins, S. D., & Keane, S. P. (2009). Family stress and parental responses to children's negative emotions: Tests of the spillover, crossover, and compensatory hypotheses. *Journal of Family Psychology, 23*(5), 671–679.

Pearson, V., & Chan, T. W. L. (1993). The relationship between parenting stress and social support in mothers of children with learning disabilities: A Chinese experience. *Social Science and Medicine, 37*(2), 267–274.

Pozo, P., Sarriá, E., & Brioso, A. (2014). Family quality of life and psychological well-being in parents of children with autism spectrum disorders: a double ABCX model. *Journal of Intellectual Disability Research, 58*(5), 442-458.

R Core Team (2004). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Rivard, M., Terroux, A., Parent-Boursier, C., & Mercier, C. (2014). Determinants of stress in parents of children with autism Spectrum disorders. *Journal of Autism and Developmental Disorders, 44*(7), 1609–1620.

Rodriguez, G., Hartley, S. L., & Bolt, D. (2019). Transactional relations between parenting stress and child autism symptoms and behavior problems. *Journal of Autism and Developmental Disorders, 49*(5), 1887–1898.

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software, 48*(2), 1–36.

Schlebusch, L., Dada, S., & Samuels, A. E. (2017). Family quality of life of south African families raising children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 47*(7), 1966–1977.

Sharabi, A., & Marom-Golan, D. (2018). Social support, education levels, and parents' involvement: A comparison between mothers and fathers of young children with autism Spectrum disorder. *Topics in Early Childhood Special Education, 38*(1), 54–64.

Summers, J. A., Marquis, J., Mannan, H., Turnbull, A. P., Fleming, K., Poston, D., Wang, M., & Kupzck, K. (2007). Relationship of perceived adequacy of services, family-professional partnerships, and family quality of life in early childhood service programs. *International Journal of Development, Disability, and Education, 54*(3), 319–338.

Sun, X., Allison, C., Wei, L., Matthews, F. E., Auyeung, B., Wu, Y. Y., Griffiths, S., Zhang, J., Baron-Cohen, S., & Brayne, C. (2019). Autism prevalence in China is comparable to Western prevalence. *Molecular Autism, 10*(1), 1–19.

Tait, K., L. Mundia, and F. Fung. (2018). "Raising young children with autism spectrum disorders in Hong Kong: The impact of cultural values and stigma on Chinese parents' coping strategies." IJASSH.

Thullen, M., & Bonsall, A. (2017). Co-parenting quality, parenting stress, and feeding challenges in families with a child diagnosed with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 47*(3), 878–886.

Turnbull, A. P., Summers, J. A., & Brotherson, M. J. (1984). *Working with families with disabled members: A family systems approach*. Research & Training Center on Independent Living: University of Kansas.

Turnbull, A. P., Summers, J. A., Lee, S. H., & Kyzar, K. (2007). Conceptualization and measurement of family outcomes associated with families of individuals with intellectual disabilities. *Mental Retardation and Developmental Disabilities Research Reviews, 13*(4), 346–356.

Wang, M., Turnbull, A. P., Summers, J. A., Little, T. D., Poston, D. J., Mannan, H., & Turnbull, R. (2004). Severity of disability and income as predictors of parents' satisfaction with their family quality of life during early childhood years. *Research and Practice for Persons with Severe Disabilities, 29*, 82–94.

Wang, P., & Michaels, C. A. (2009). Chinese families of children with severe disabilities: Family needs and available support. *Research and Practice for Persons with Severe Disabilities, 34*(2), 21–32.

Xiaoyi, H. (2016). Family quality of life and family support of children with disabilities in China. *Chinese Journal of Rehabilitation Theory and Practice, 22*(10), 1227-1231.

Zeng, S., Hu, X., Zhao, H., & Stone-MacDonald, A. K. (2020). Examining the relationships of parental stress, family support and family quality of life: A structural equation modeling approach. *Research in Developmental Disabilities, 96*, 103523. https://doi.org/10.1016/j.ridd.2019.103523.

Zhou, T., Wang, Y., & Yi, C. (2018). Affiliate stigma and depression in caregivers of children with autism Spectrum disorders in China: Effects of self-esteem, shame and family functioning. *Psychiatry Research, 264*, 260–265.

Zuna, N. I., Selig, J. P., Summers, J. A., & Turnbull, A. P. (2009). Confirmatory factor analysis of a family quality of life scale for families of kindergarten children without disabilities. *Journal of Early Intervention, 31*(2), 111–125.

Zuna, N., Summers, J. A., Turnbull, A. P., Hu, X., & Xu, S. (2010). Theorizing about family quality of life. In R. Kober (Ed.), *Enhancing the quality of life of people with intellectual disabilities* (pp. 241–278). New York, NY: Springer.

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