

Coping and Well-Being in Parents of Children with Autism Spectrum Disorders (ASD)

Wei Wei Lai¹ · Tze Jui Goh² · Tian P. S. Oei¹ · Min Sung²

Published online: 24 March 2015

© Springer Science+Business Media New York 2015

Abstract This study examined psychological well-being and coping in parents of children with ASD and parents of typically developing children. 73 parents of children with ASD and 63 parents of typically developing children completed a survey. Parents of children with ASD reported significantly more parenting stress symptoms (i.e., negative parental self-views, lower satisfaction with parent–child bond, and experiences of difficult child behaviors), more depression symptoms, and more frequent use of Active Avoidance coping, than parents of typically developing children. Parents of children with ASD did not differ significantly in psychological well-being and coping when compared as according to child’s diagnosis. Study results reinforced the importance of addressing well-being and coping needs of parents of children with ASD.

Keywords Well-being · Depression · Anxiety · Coping · Parenting stress · Autism spectrum disorders · Asia

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder defined by deficits in communication and social interaction, and the engagement in restricted and repetitive patterns of behaviors (American Psychiatric Association 2013). Individuals with ASD face daily challenges in

multiple domains of their lives, including poor adaptive functioning, anxiety, hyperactivity, and obsessive–compulsive behaviors (Bauman 2010; Huang et al. 2014; Peters-Scheffer et al. 2012; Simonoff et al. 2008; Wang et al. 2011). Recently, studies have cited a rising trend in ASD prevalence worldwide, with increasing incidence of children with ASD in both Caucasian and Asian populations (Centers for Diseases Control and Prevention 2012; Elsabbagh et al. 2012). Disease burden research in Singapore also cited ASD-related health problems to be most debilitating when compared to other child and adolescent physical and mental health disorders (Ministry of Health 2004). The chronic nature of ASD and associated behavioral and emotional challenges contribute to persistent caregiving and parenting stress among parents of children with ASD (Benson and Karlof 2009).

Previously, parents of children with ASD have been reported to have poorer psychological outcomes. They have been reported to experience higher parenting stress (e.g., Hayes and Watson 2012; Griffith et al. 2010; Wang et al. 2011), and more depression and anxiety symptoms (e.g., Baker et al. 2011; Benson and Karlof 2009; Estes et al. 2009; Gallagher et al. 2008), compared to parents of typically developing children or children with other developmental disabilities such as intellectual disability and Down Syndrome. Child characteristics such as the severity of condition (e.g., Abbeduto et al. 2004; Konstantareas and Papageorgiou 2006), adaptive functioning level of the child (e.g., Hall and Graff 2011), ASD-related behaviors (e.g., Huang et al. 2014), behavior problems (e.g., Gray 2006; Hall 2012; Lecavalier et al. 2006), child’s age (e.g., Smith et al. 2008) and gender (e.g., Mandell and Salzer 2007), have been suggested to impact the psychological well-being and coping approaches of parents of children with ASD. However, in particular, ASD-related behaviors and

✉ Wei Wei Lai
weiwei.lai@my.jcu.edu.au

¹ Department of Psychology, James Cook University
Singapore, 149 Sims Drive, Singapore 387380, Singapore

² Department of Child and Adolescent Psychiatry, Institute of
Mental Health, Singapore, Singapore

behavioral functioning of the child were reported to impact parenting stress inconsistently (Huang et al. 2014; Mori et al. 2009; Pearson et al. 2006; Phetrasuwan and Miles 2009; Wang et al. 2011). For instance, some studies noted a positive relationship between parenting stress and severity level of child's ASD-related behaviors (e.g., Konstantareas and Papageorgiou 2006; Mori et al. 2009; Phetrasuwan and Miles 2009; Wang et al. 2011). However, other researchers such as Huang et al. (2014) and Pearson et al. (2006) reported that parents of children showing mild to moderate levels of ASD-related behaviors felt the most stress in parenting their child. Although child's behaviors, functioning level, age and gender were observed to affect parenting and caregiving stress, our understanding of the effects of these factors has not been conclusive. Further duplication and examination of current research is needed for a well-rounded understanding of parental and caregivers' well-being (Griffith et al. 2010; Abbeduto et al. 2004).

Parents of children with ASD use a range of coping strategies and resources when faced with parenting/caregiving stress (Hall and Graff 2011; Hastings et al. 2005; Lai and Oei 2014; Luong et al. 2009). In a review paper, Lai and Oei (2014) highlighted that parents of children with ASD used both adaptive (e.g., cognitive reframing; seeking social support) and maladaptive (e.g., avoidance and disengagement) coping strategies, with an inclination towards adaptive coping methods such as seeking social support and positive reinterpretation. Among parents of children with ASD, the use of adaptive coping strategies has also been linked to positive mental health outcomes (Benson 2010; Penley et al. 2002; Taylor and Stanton 2007). While it may then be expected that parents of children with ASD adapt well to parenting stress, past studies have also consistently reported elevated stress symptoms in these parents (Hayes and Watson 2012). It is therefore unclear if parents of children with ASD are coping with parenting/caregiving stress adequately and effectively (Hayes and Watson 2012). Moreover, some studies suggested more frequent use of maladaptive coping strategies among parents of children with ASD than parents of children with non-ASD developmental disabilities or those of typical development (e.g., Montes and Halterman 2007; Piazza et al. 2014; Sivberg 2002; Wang et al. 2011). In general, the nature of parenting stress and coping in parents of children with ASD, especially when compared to parents of children not diagnosed with this disorder, remains inconclusive (Lai and Oei 2014; Sivberg 2002; Wang et al. 2011).

Currently, there is a paucity of research in parental well-being and coping among Asian parents of children with ASD residing in Asian countries (Lai and Oei 2014; Moh and Magiati 2012; Yeo and Lu 2012). Previously, Asia-

based studies have either (1) reported differences in parenting/caregiving experiences by comparing parents of children with ASD residing in different countries (e.g., Yeo and Lu 2012) or (2) examined parents' overall experience of the diagnostic process for their child (e.g., Moh and Magiati 2012). While having their merits, comparisons across different countries overlook the differences in parenting culture, environment and expectations that is inherent in the population, which can alter the impact of raising a child with ASD (Lai and Oei 2014).

Studies based on parents of different ethnic backgrounds have suggested that Caucasian parents of children with ASD engage in emotion-focused coping methods such as passive appraisal and avoidance more frequently than Asian parents (Lin et al. 2008; Luong et al. 2009; Oyserman et al. 2002), while Asian parents of children with ASD engage more frequently in problem-focused coping strategies than Caucasian parents (Luong et al. 2009; Twoy et al. 2007). In the general stress and coping literature, emotion-focused coping is suggested to be psychologically maladaptive and problem-focused coping is linked to adaptive psychological adjustment (Penley et al. 2002; Taylor and Stanton 2007). Implicatively, Asian parents of children with ASD may then cope better with stress than Caucasian parents (Benson 2010; Penley et al. 2002; Taylor and Stanton 2007). Despite this, it is also possible that Asian-related ideologies such as "saving face" can influence Asian parents to internalize any stressful feelings felt, and not reach out for support, to avoid the social stigma of having a child with a developmental disability (Kawachi and Berkman 2001; Mak and Ho 2007; Uchino 2006).

As discussed, inconsistent findings on stress and coping research in parents of children with ASD and existing cultural differences between Asian- and western-based studies render any direct application of western literature on Asian populations limited. Therefore, this paper aimed to examine the psychological well-being and coping strategies of parents of children with ASD in Singapore, an Asian but multi-ethnic population. It is hypothesized that (1) parents of children with ASD would report more parenting stress, depression and anxiety symptoms, than parents of typically developing children. Since ASD-related behaviors can impact parenting stress to varying degrees (ref. Huang et al. 2014; Wang et al. 2011), the current study also sought to understand parenting stress, and parent-reported depression and anxiety symptoms based on the diagnosis of the child (i.e., comparing between parents of children with Autism, Asperger's Syndrome, PDD-NOS and of typical development), as an elaboration of Hypothesis (1). Practically, this categorization of parental experiences could also be valuable in assisting clinicians to tune in quickly to the needs of specific parent populations based on child's reported diagnosis (Huang et al. 2014).

Finally, while previous research highlighted that parents of children with ASD coped well with stress (e.g., Lai and Oei 2014), they were also reported to experience higher parenting stress and to use more maladaptive than adaptive coping strategies when compared to parents of children not diagnosed with an ASD (Hayes and Watson 2012; Montes and Halterman 2007; Piazza et al. 2014; Wang et al. 2011). Therefore, this study sought to contribute to the limited literature on ASD-related parental stress and coping, by examining whether parents of children with ASD used more adaptive or maladaptive coping strategies than parents of typically developing children.

Method

Participants

One hundred and thirty-six parents participated in the study. 54 % of recruited parents reported having a child with ASD and 46 % of parents had a child who did not have a diagnosis of ASD or other chronic medical conditions. Parents reported a mean age of 43.68 years (SD = 6.36) and were (1) mostly mothers (80.9 %), (2) not working or retired (35.3 %), and (3) with graduate/postgraduate education (36.8 %). The sample consisted mainly of parent–child pairs who were Chinese (81.6 %). Most of the children being rated were boys (56.6 %). Table 1 summarizes additional information on sample demographics.

Measures

Demographics Screening Form

Participants completed a form on personal demographics (i.e., age, gender, ethnicity), socio-economic statuses (i.e., profession, education level), child's characteristics (i.e., age, gender, diagnosis), and family variables (i.e., additional child with ASD in the family, additional help engaged for caregiving) that may impact parent outcomes and coping.

Parenting Stress Index: Short Form (PSI/SF; Abidin 1992)

The PSI/SF is a 36-item self-report form measuring parenting-related stressful behaviors and feelings based on three subscales of parental distress (PD), parent–child dysfunctional interaction (P-CDI), and difficult child (DC). A PSI/SF Total score is computed from the three subscale scores of items rated on a five-point rating scale (i.e., from 1 = “Strongly Disagree” to 5 = “Strongly Agree”). The

PSI/SF is a widely used tool in clinical research with adequate psychometric properties (Abidin 1992). All scales from the PSI/SF displayed strong internal consistencies, with Cronbach's alpha coefficients of .93 (PSI/SF Total), .84 (PD), .86 (P-CDI), and .82 (DC) for the present study (see diagonals in Table 2).

Depression Anxiety Stress Scales (DASS-21; Lovibond and Lovibond 1995)

The DASS-21 is a self-report screening tool, which measures frequency of behaviors or intensity of feelings based on three subscales of anxiety (DASS-A), depression (DASS-D) and stress (DASS-S). It is used to measure the status of psychological well-being of parents in the current study. A DASS total score is computed from the three subscale scores of items rated on a four-point scale (i.e., from 0 = “Did not apply to me” to 3 = “Applied to me very much or most of the time”). The DASS-21 demonstrated sound psychometric properties, is used widely in clinical and non-clinical samples, and has also been validated for use in Asia (Lovibond 2011; Oei et al. 2013). In this study, strong internal consistencies of the DASS Total Scale, DASS-D, DASS-A, and DASS-S subscales were achieved with Cronbach's coefficient alphas of .94 (DASS Total), .88 (DASS-D), .83 (DASS-A) and .92 (DASS-S; see diagonals in Table 2).

Brief COPE (Carver et al. 1989)

The Brief COPE is a self-reporting, 28-item version of the COPE instrument that measures the usage frequencies of broad-based maladaptive and adaptive coping strategies. Items are rated on a four-point rating scale (i.e., from 1 = “I haven't been doing this at all” to 4 = “I've been doing this a lot”; Carver 2007). The psychometric properties of the Brief COPE have been previously examined, and the instrument is used in many studies on stress and coping, with clinical or non-clinical samples (Carver 1997).

In this study, the Brief COPE was analyzed using four sub-domains (i.e., Active Avoidance coping, problem-focused coping, positive coping, and religious/denial coping) as derived in Hastings et al. (2005) based on a sample of parents of children diagnosed with ASD. This approach was adopted to maximize construct validity of the Brief COPE on the current study sample. Internal consistency evaluations of the Brief COPE total and subscale scores were adequate, with Cronbach's coefficient alphas of .92 (Brief COPE total), .76 (Active Avoidance coping), .89 (problem-focused coping), .83 (positive coping), and .69 (religious/denial coping; see diagonals in Table 2).

Table 1 Means, standard deviations, frequencies and ANOVA/Chi-square comparisons of participant characteristics by child’s diagnosis

	AUT (N = 43)	AS (N = 15)	PDD-NOS (N = 15)	TD (N = 63)	Total (N = 136)	ANOVA (DSM-5)		ANOVA (DSM-IV)	
						F(1, 129)	η^2	F(3, 127)	η^2
Age, M (SD)									
Parent’s age (years)	46.10 (5.50)	46.00 (4.36)	48.30 (5.73)	41.00 (6.23)	43.68 (6.36)	25.19	.17	10.02*	.19
Child’s age (years)	14.10 (3.60)	12.90 (4.00)	13.25 (2.72)	10.80 (3.19)	12.35 (3.67)	25.97	.16	8.93*	.17
<i>Chi-square goodness-of-fit</i>						<i>Chi-square statistic</i>		<i>Chi-square statistic</i>	
Gender									
Male (parent)	8 (5.9 %)	1 (.7 %)	6 (4.4 %)	11 (8.1 %)	26 (19.1 %)	.17		46.1	
Female (parent)	35 (25.7 %)	14 (10.3 %)	9 (6.7 %)	52 (38.2 %)	110 (80.9 %)	.56		8.67	
Male (child)	35 (25.7 %)	10 (7.4 %)	11 (8.1 %)	21 (15.4 %)	77 (56.6 %)	20.06*		23.22*	
Female (child)	8 (5.9 %)	5 (3.7 %)	4 (2.9 %)	42 (30.9 %)	59 (43.4 %)	9.93*		63.90*	
Ethnicity									
Chinese	37 (27.2 %)	14 (10.3 %)	14 (10.3 %)	46 (33.8 %)	111 (81.6 %)	4.48		24.07	
Malay	3 (2.2 %)	0	1 (.7 %)	10 (7.4 %)	14 (10.3 %)	2.57		9.57	
Indian	2 (1.5 %)	0	0	4 (2.9 %)	6 (4.4 %)	2.00		2.00	
Others (including Eurasian)	1 (.7 %)	1 (.7 %)	0	3 (2.2 %)	5 (3.7 %)	–		1.00	
Occupation									
Managerial/professional	10 (7.4 %)	6 (4.4 %)	7 (5.1 %)	12 (8.8 %)	35 (25.7 %)	4.24		2.00	
Sales/executive	5 (3.7 %)	0	0	13 (9.6 %)	18 (13.3 %)	3.56		3.56	
Clerical/technical	3 (2.2 %)	2 (1.5 %)	2 (1.5 %)	7 (5.1 %)	14 (10.3 %)	.07		3.93	
Self-employed	6 (4.4 %)	1 (.7 %)	0	5 (3.7 %)	12 (8.8 %)	.33		3.5	
Not working/retired	15 (11.0 %)	7 (5.1 %)	3 (2.2 %)	23 (16.9 %)	48 (35.3 %)	.38		17.62	
Others	3 (2.2 %)	0	3 (2.2 %)	3 (2.2 %)	9 (6.6 %)	1.00		–	
Education									
University/postgraduate	16 (11.8 %)	7 (5.1 %)	5 (3.7 %)	22 (16.2 %)	50 (36.8 %)	.33		.33	
Polytechnic/pre-university	8 (5.9 %)	3 (2.2 %)	2 (1.5 %)	17 (12.5 %)	30 (22.0 %)	.61		12.17	
Secondary/vocational	13 (9.6 %)	4 (2.9 %)	8 (5.9 %)	20 (14.7 %)	45 (33.1 %)	.13		15.33	
Primary or below	1 (.7 %)	0	0	2 (1.5 %)	3 (2.2 %)	1.65		10.02	
Others	5 (3.7 %)	1 (.7 %)	0	2 (1.5 %)	8 (5.9 %)	2.00		3.25	
Additional child with ASD									
Yes	2 (1.5 %)	1 (.7 %)	2 (1.5 %)	0	5 (3.7 %)	–		.40	
No	41 (30.1 %)	14 (10.3 %)	13 (9.6 %)	63 (46.3 %)	131 (96.3 %)	.79		44.1	
Help with caregiving									
Yes	10 (7.4 %)	2 (1.5 %)	4 (2.9 %)	13 (9.6 %)	29 (21.3 %)	1.67		27.20	
No	33 (24.3 %)	13 (9.6 %)	11 (8.1 %)	50 (36.8 %)	107 (78.7 %)	.13		14.00	

AUT Autism, AS Asperger’s Syndrome; PDD-NOS pervasive developmental disorder—not otherwise specified, TD typically developing

* $p < .05$

Procedures

Parents of children with ASD registered with the Neuro-Behavioural Clinic (NBC) at the Child Guidance Clinic (CGC), Institute of Mental Health (IMH) in Singapore between year 2006 and 2013 were recruited via study invitation letters. Based on medical records from the NBC Autism Services unit, registered patients with NBC Autism Services have either been diagnosed with Autism, Asperger’s Syndrome or PDD-NOS, via psychiatrists’

clinical assessment or a formal assessment session using the Autism diagnostic interview—revised (ADI-R) and Autism diagnostic observation schedule (ADOS; Lord et al. 1994, 2000). Parents of children with ASD completed consent and questionnaires anonymously via self-addressed envelopes. Consequently, child’s diagnosis as reported by parents could not be crosschecked with medical records, as parent responses were anonymous. Parents of typically developing children (control group) were recruited via study advertisements posted at the Student Health Centre,

Table 2 Correlations and Cronbach's alpha (bold and diagonal) between PSI/SF, DASS-21, Brief COPE, and parent socio-demographic variables

	Child's condition ^a	PSI total	Parent distress	Parent-child interaction	Difficult child	DASS total	Depression	Anxiety	Stress	Brief COPE total	Active Avoidance	Problem-focused	Positive	Religious/denial
PSI/SF total	-.36**	.93	.89**	.93**	.89**	.51**	.58**	.34**	.50**	.19*	.40**	.16	.07	.16
Parent distress	-.40**	.84	.74**	.74**	.65**	.53**	.61**	.33**	.50**	.13	.37**	.09	-.01	.12
Parent-child interaction	-.32**	.86	.77**	.86	.77**	.45**	.50**	.33**	.42**	.16	.37**	.12	.06	.16
Difficult child	-.24**	.82	.82	.82	.82	.41**	.46**	.25**	.42**	.23**	.35**	.22*	.16	.16
DASS total	-.06				.94	.94	.92**	.90**	.95**	.43**	.65**	.32**	.24**	.37**
Depression	-.07				.88	.88	.88	.73**	.82**	.35**	.56**	.27**	.16	.32**
Anxiety	-.01				.83	.83	.83	.83	.79**	.43**	.60**	.30**	.26**	.36**
Stress	-.09				.92	.92	.92	.92	.92	.41**	.63**	.32**	.25**	.34**
Brief COPE total	-.02					.92	.92	.92	.92	.92	.75**	.87**	.83**	.70**
Active Avoidance	-.14						.76	.76	.76	.76	.76	.55**	.51**	.54**
Problem-focused	-.09							.89	.89	.89	.89	.89	.79**	.57**
Positive	-.08												.83	.45**
Religious/denial	-.08													.69

Cronbach's coefficient alphas for total and subscales of PSI/SF, DASS, and Brief COPE in bold typesetting

^a Child's condition nominally coded, i.e., 1, Autism; 2, Asperger's Syndrome; 3, PDD-NOS; 4, typically developing

* $p < .05$; ** $p < .01$

Health Promotion Board, in Singapore or via snowballing recruitment method. All parents provided informed consent. Study participation was (1) voluntary, (2) took an average of 20 minutes for each participant, (3) assured of total response confidentiality from public, and (4) offered a small appreciation fee of \$10 Singapore dollars upon questionnaire completion. Ethics approval was obtained from the National Healthcare Group Domain-Specific Review Board (DSRB) Singapore and the James Cook University Human Research Ethics Committee (HREC).

Data Analyses

In consideration of Hypothesis 1, parent responses were first compared based on whether their child has been diagnosed with an ASD (i.e., between parents of children diagnosed with an ASD and parents of typically developing children). To further assess if parenting stress and parental psychological well-being varied with child's diagnosis, parent responses were also separated and compared in four groups according to child's diagnosis status as reported by parents: (1) Autism, (2) Asperger's Syndrome, (3) PDD-NOS, and (4) children who were not diagnosed with ASD or other chronic medical/mental health conditions.

MANOVA and Chi-square analyses were conducted to highlight differences in the demographical characteristics between all parent groups (i.e., Autism vs. Asperger's Syndrome vs. PDD-NOS vs. typical development). A MANOVA using two-tailed *t* test statistic was used to compare mean frequencies of self-reported parenting stress, psychological well-being (operationalized as depression and anxiety symptoms), and the use of coping strategies between parent groups. Total and subscale mean scores of each study measure were analyzed separately to identify group differences in the overall and sub-categorical measures of parenting stress, parental psychological well-being and coping. Analysis of variance (ANOVA) statistical methods were used for post hoc comparison testing of group means for specific dependent variables. Threshold for statistical significance was set at $p < .05$.

Results

Differences in Demographical Characteristics

Only differences in parent's and child's age, and child's gender, were statistically significant between parent groups at $p < .05$ (see Table 1). Post-hoc ANOVA comparisons indicated that only parents and their children in the Autism group were significantly older than parents and their typically developing children. Chi-square goodness-of-fit tests also indicated (1) significantly more male than female

children being rated by their parents in the Autism group, and (2) significantly more female than male children of typical development being rated by their parents. Considering the observed differences, age and gender effects on parental outcomes and coping were controlled for by including parent's and child's age and child's gender as fixed-effect covariates in subsequent study analyses. However, this control for age and gender effects did not alter the interpretation of study results significantly. Implications of these differences are further discussed in the "Discussion" section.

Preliminary Data Analyses

Positive skewness on the PSI/SF and DASS Total and subscale mean scores were expected as the sample contained parents of typically developing children who may not experience as much parenting stress as parents of children with ASD in caregiving (ref. Hayes and Watson 2012). Transformation of data using square-root transformation technique did not alter results interpretation significantly. No outliers were found by examining box-and-whiskers plot diagrams. For all MANOVA analyses, Levene's test for homogeneity of variance also did not attain statistical significance at $p < .05$, suggesting that homogenous variance was observed for all comparison groups. Thus, untransformed data was used and reported for data analyses. Self-reported parenting stress, psychological well-being and coping scale scores did not differ significantly (a) between mothers and fathers in general, or (b) between gender of child being rated, $p < .05$.

Comparisons Between ASD and Typical Development

A one-way MANOVA was conducted to examine group differences in parenting stress, psychological well-being outcomes (i.e., self-reported depression and anxiety symptoms) and parental coping between parents of children with ASD and parents of typically developing children. Multivariate tests of group means reached statistical significance, Wilks' Lambda = .79, $F(3, 132) = 11.96$, $\eta^2 = .21$. An estimate of 21 % of the error variance in the parenting stress, psychological well-being and coping total scale mean scores can be explained by differences in parents' group membership. MANOVA of group means in the sub-categories of parenting stress and psychological well-being also reached statistical significance, Wilks' Lambda = .70, $F(10, 125) = 5.35$, $\eta^2 = .30$. An estimate of 30 % of the error variance in the parenting stress, psychological well-being and coping subscale mean scores can be explained by differences in parents' group membership. Based on these significant MANOVA results, group

differences in parent outcomes and coping scale scores were examined as below.

Parenting Stress

Post-hoc ANOVA of group means revealed statistically significant differences in (1) overall parenting stress levels as measured by PSI/SF total scale scores and (2) all three sub-domains of parenting stress as measured by the PSI/SF PD, P-CDI and DC subscale scores between parents of children with ASD and parents of typically developing children (see Table 3). Findings suggest that parents of children with ASD experienced higher parenting stress in general, and more symptoms in each sub-domain of parenting stress (i.e., more negative views of themselves as parents, poorer parent-child relationships and more child-related parenting stress) than parents of typically developing children (see Fig. 1).

Psychological Well-Being

Post-hoc ANOVA of group means showed statistically significant differences between parents of children with ASD and parents of typically developing children in DASS-D subscale scores only (see Table 3). It is suggested that parents of children with ASD experienced more depression symptoms than parents of typically developing children (see Fig. 1).

Parental Coping

Post-hoc ANOVA of group means showed statistically significant differences between parents of children with ASD and parents of typically developing children in the Brief COPE Active Avoidance subscale scores only (see Table 3). Findings suggest that parents of children with ASD engaged in Active Avoidance coping more frequently than parents of typically developing children.

Comparisons Between ASD Sub-Groups and Typical Development

To understand how parental outcomes differed with child's diagnosis as an extension of Hypothesis 1, a one-way MANOVA was employed to examine differences in parenting stress and psychological well-being outcomes between the four groups of (1) parents of children with Autism, (2) parents of child with Asperger's Syndrome, (3) parents of children with PDD-NOS, and (4) parents of typically developing children. Parental coping scores were not analyzed as coping differences between parents of children with ASD and parents of typically developing children were previously addressed.

Multivariate tests of group means reached statistical significance, Wilks' Lambda = .76, $F(9, 317) = 4.22$, $\eta^2 = .88$. An estimate of 88 % of the error variance in the parenting stress, psychological well-being and coping total

Table 3 Group means, standard deviations, and ANOVA comparisons for total and subscale scores of PSI/SF, DASS-21, Brief COPE, based on DSM-V and DSM-IV criteria

ANOVA effects	AUT		AS		PDD-NOS		TD		ASD		ANOVA (DSM-5)		ANOVA (DSM-IV)	
	M	SD	M	SD	M	SD	M	SD	M	SD	F(3, 134)	η^2	F(3, 132)	η^2
PSI/SF total	97.70	21.97	101.40	19.68	105.47	27.58	79.27	18.67	90.29	23.37	32.11**	.19	11.63**	.21
PSI/SF parent distress	33.72	7.65	35.00	7.919	36.87	9.43	26.00	7.18	29.51	9.04	42.34**	.24	14.89**	.25
PSI/SF parent-child dysfunctional interaction	7.65	9.77	7.919	7.86	9.425	9.83	7.18	6.94	30.03	8.95	25.54**	.16	9.25**	.17
PSI/SF difficult child	31.79	8.00	33.00	7.63	33.47	10.29	27.60	6.51	32.12	8.43	11.95**	.08	4.69**	.10
DASS-21 total	10.77	9.27	12.73	9.92	14.73	13.48	9.41	9.98	10.86	10.20	2.39	.02	1.31	.03
DASS-depression	2.91	3.19	4.67	4.40	5.27	5.50	2.43	3.09	3.18	3.72	4.88*	.04	3.52*	.07
DASS-anxiety	2.77	2.90	2.20	1.78	3.20	4.20	2.62	3.63	2.71	3.29	.09	.00	.24	.01
DASS-stress	5.09	4.08	5.87	4.42	6.27	4.48	4.37	3.83	4.98	4.05	2.73	.10	1.24	.03
Brief COPE total	–	–	–	–	–	–	49.03	15.18	50.94	13.62	2.33	.17	–	–
Active Avoidance	–	–	–	–	–	–	13.37	4.005	14.09	3.76	4.44*	.04	–	–
Problem-focused	–	–	–	–	–	–	14.59	5.48	15.40	5.23	2.85	.04	–	–
Positive coping	–	–	–	–	–	–	12.24	4.70	12.43	4.21	.25	.62	–	–
Religious/denial	–	–	–	–	–	–	8.84	3.08	9.02	3.17	.38	.54	–	–

* $p < .05$

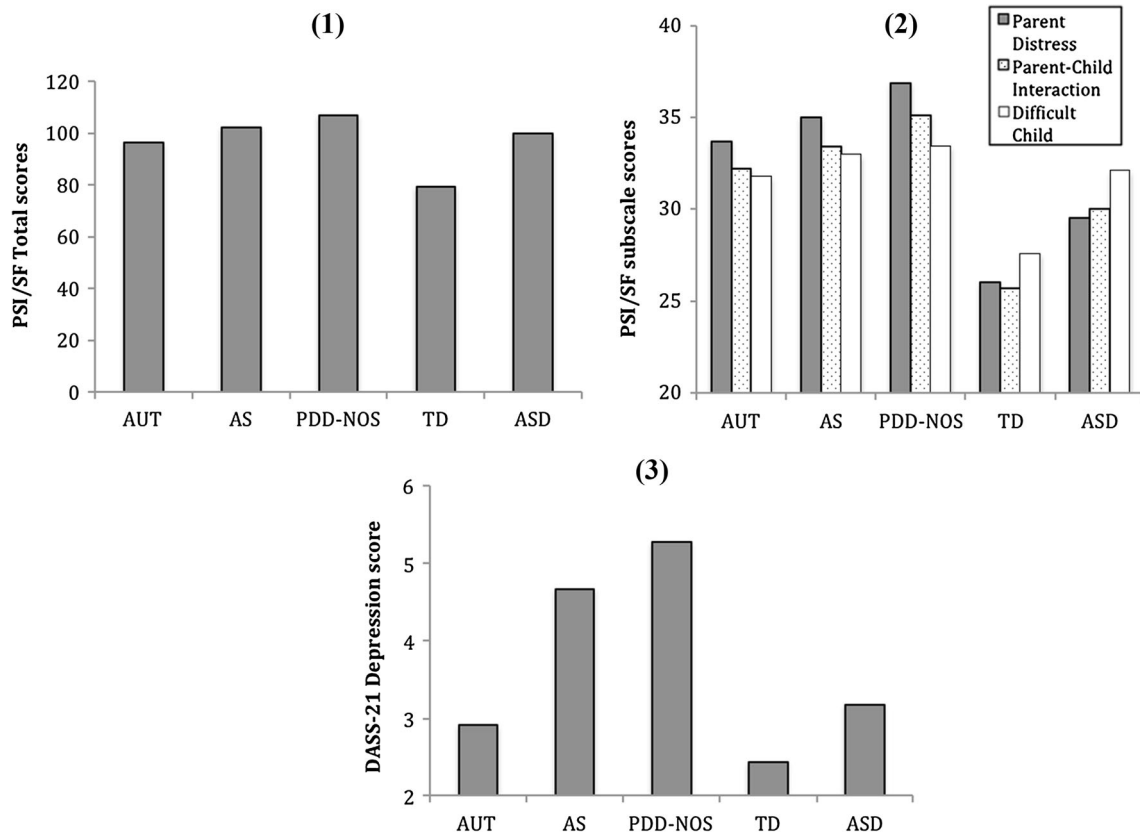


Fig. 1 PSI/SF total scores, PSI/SF subscale scores and DASS-21 depression subscale scores of **1** parents of children with Autism spectrum disorders (ASD) as a group, **2** parents of children with

Autism (AUT) or Asperger’s syndrome (AS) or pervasive developmental disorder—not otherwise specified (PDD-NOS) and **3** parents of typically developing (TD) children

scale mean scores can be explained by differences in child’s diagnosis. Multivariate tests of group means in the sub-categories of parenting stress, psychological well-being, and coping strategies also reached statistical significance, Wilks’ Lambda = .58, $F(30, 362) = 2.47$, $\eta^2 = .17$. An estimate of 17 % of the error variance in the parenting stress, psychological well-being and coping subscale mean scores can be explained by differences in child’s diagnosis. Significant MANOVA effects as above suggest differences in parent outcomes. Further analyses were conducted to examine group differences in the sub-components of parenting stress and parental psychological well-being outcomes.

Parenting Stress

Post-hoc ANOVA revealed statistically significant differences between the four parent groups in (1) overall parenting stress as measured by PSI/SF total mean scores (see Table 3), and (2) all three sub-domains of parenting stress as measured by the PSI/SF PD, P-CDI and DC subscale mean scores (see Table 3). Comparison testing using post hoc ANOVA showed that PSI/SF total mean scores, and

PSI/SF PD and P-CDI subscale mean scores, differed significantly between parents of typically developing children and each of the three parent groups with children with (1) Autism, (2) Asperger’s Syndrome, or (3) PDD-NOS only. For PSI/SF DC subscale scores, significant differences were observed between parents of children with Autism or PDD-NOS and parents of typically developing children only.

In agreement with prior analyses based on parents of children with ASD as a group, findings suggest that parents of children diagnosed with any sub-category of ASD experience higher overall parenting stress, more negative views of themselves as parents, and less satisfaction in parent–child bond, than parents of typically developing children (see Fig. 1). Incongruent with analyses based on parents of children with ASD as a group, only parents of children diagnosed with either Autism or PDD-NOS reported more child-related parenting stress than parents of typically developing children (see Fig. 1). There were no significant differences in the overall and sub-domain measures of parenting stress between parents of children diagnosed with each sub-category of ASD.

Psychological Well-Being

Post-hoc ANOVA analyses observed statistically significant differences between parent groups in the DASS-D subscale mean scores only (see Table 3). Comparison testing using post hoc ANOVA showed that DASS-D subscale scores only differed significantly between parents of typically developing children and parents of children with PDD-NOS (see Table 3). Results imply that parents of children with PDD-NOS experienced more depression-related symptoms than parents of typically developing children (see Fig. 1). There were no significant differences in the overall and sub-domain measures of psychological well-being between parents of children diagnosed with each sub-category of ASD.

Discussion

Results showed that parents of children with a diagnosis of ASD reported more parenting stress and depression symptoms, and engaged in more maladaptive coping (i.e., Active Avoidance coping), than parents of typically developing children. Generally, findings from this study provided additional support that providing care for a child with ASD has a negative psychological effect on caregivers (e.g., Benson and Karlof 2009; Hayes and Watson 2012; Stuart and McGrew 2009).

Parental Psychological Well-Being Outcomes

In this study, parents of children with ASD experienced more parenting stress symptoms than parents of typically developing children. Previous research highlighted that stress proliferation and compounded caregiving demands aggravated the impact of negative caregiving experiences and feelings in parents of children with ASD over time (Benson 2010; Benson and Karlof 2009). Implicatively, and in agreement with previous literature, parenting stress is expected to heighten when parents care for any child with a chronic condition such as ASD in this study (Hayes and Watson 2012).

It is of note that the same pattern of findings in parenting stress and psychological well-being outcomes were observed whether responses from parents of children with ASD were compared as a group or based on child's reported diagnosis (i.e., aligned with DSM-4 criteria). Therefore, findings from this study suggest no discernable differences in parenting stress when parenting children diagnosed with any sub-category of ASD. Although parents of children with ASD did not differ among themselves in parenting stress and psychological well-being outcomes, the effects of some factors on parental well-being outcomes

may warrant further investigation. For instance, previous research highlighted that parents' acceptance of child's social and communicative challenges played a role in the impact of parenting stress on psychological well-being outcomes (Lee 2009; Ling et al. 2010; Mori et al. 2009; Rao and Beidel 2009; Szatmari et al. 1995). In addition, factors such as child's daily and ASD-related behaviors (e.g., Lecavalier et al. 2006; Huang et al. 2014), the level of adaptive functioning of the child (e.g., Abbeduto et al. 2004; Hall and Graff 2011; Konstantareas and Papageorgiou 2006), and child's learning abilities and schooling arrangements (e.g., Lee et al. 2008; Nevo and Bin Khader 1995) can moderate the intensity of parenting stress felt by parents. In view of the above-mentioned findings, further examination of the factors that influence parenting stress experiences and parental psychological well-being outcomes is needed. Qualitative methods supporting more in-depth documentation of caregiving experiences can be considered to achieve this endeavor (Creswell 2012; Lai and Oei 2014).

In addition to stress, parents of children with ASD in our study reported more depressive symptoms, and no significant differences in anxiety symptoms, when compared to parents of typically developing children. Previous research has highlighted that parent-reported anxiety (but not depression) symptoms fluctuated across circumstances and time, while depression symptoms developed on a more stable trajectory (Baker et al. 2011; Benson and Karlof 2009; Gray 2003, 2006; Griffith et al. 2010; Luong et al. 2009). Considering this, it is then possible that parent-reported anxiety symptoms are insufficiently salient at this point in time to observe significant differences between parent comparison groups. Longitudinal studies evaluating parental psychological well-being at various time points of their child's development will provide further information for a well-rounded understanding of the mental health status, as well as parenting stress experiences, of parents of a child diagnosed with ASD (Gray 2003, 2006).

Parental Coping Strategies

In this study, parents of children with ASD were observed to engage in more maladaptive/emotion-focused coping (i.e., Active Avoidance coping) than parents of typically developing children. This is consistent with previous observations that parents of children with developmental disabilities (including ASD) used maladaptive/emotion-focused coping in managing caregiving stress (e.g., Piazza et al. 2014; Sivberg 2002; Wang et al. 2011). Of note is parents' increased use of Active Avoidance coping, which suggests that parents tended to criticize themselves for the problems they faced, vent negative emotions, distract themselves from thinking about problems or give up trying

to solve their problems (Carver et al. 1989; Hastings et al. 2005).

Parents' use of Active Avoidance coping strategies (as highlighted above) may be understood in light of the cultural background of parents in this study. In an Asian society such as that in Singapore, whereby high-achieving students are valued, parents of children with ASD could find themselves constantly worrying and looking for ways to help their child or having to reconcile with their disappointment when their child does not progress as quickly their peers (Fung and Cai 1998; Luong et al. 2009; Moh and Magiati 2012; Nevo and Bin Khader 1995). Eventually, when the stamina for problem-solving diminishes while caregiving problems continue to surface, parents may engage in maladaptive/emotion-focused coping such as avoidance to cope with caregiving challenges and stressful feelings (Gray 2006). Moreover, parents' use of avoidance coping can be reinforced by the Asian-related ideology of "saving face", whereby parents avoid seeking help from others out of fear of the social stigma and embarrassment associated with having a child with special needs (Kim et al. 2001; Luong et al. 2009; McCabe 2008; Nevo and Bin Khader 1995).

Findings from this study highlight the importance of acknowledging culture-specific coping behaviors. General stress and coping mechanisms provide a primary buffer against the immediate impact of parenting stress; however, general coping strategies are limited in optimizing available coping resources for culturally nuanced stressful experiences (Sawang et al. 2006). Healthcare professionals should dedicate closer attention and support to the individual needs of parents looking after children with special needs, especially when the children are functioning at a level that requires substantial support, and present with challenging behaviors and co-morbid medical problems (Bauman 2010; Lecavalier et al. 2006; Rao and Beidel 2009).

Study Limitations

There are some considerations to the application of study findings. Firstly, study findings may not be generalizable to parents of children with ASD who did not seek professional medical help at the NBC Autism Services at IMH Singapore. Future replications could include a nation-wide survey of the psychological health of parents of children with ASD in Singapore. Secondly, the study design was cross-sectional. As psychological well-being and coping are time- and context-dependent conditions, future studies could adopt longitudinal designs to observe changing trends or highlight possible factors contributing towards parental well-being or coping strategies (Benson and Karlof 2009; Taylor and Stanton 2007). Fourthly, the study

could have benefited from comparisons with additional parent groups such as parents of children with intellectual or learning disabilities (e.g., Abbeduto et al. 2004), or other chronic medical or mental health conditions (e.g., Wang et al. 2011). This could help tease out parenting stress effects unique to parents of children with ASD for closer examination (Hayes and Watson 2012). Finally, due to the nature of convenience sampling for parents of children with ASD, sample characteristics for comparison groups (i.e., Autism, Asperger's Syndrome, PDD-NOS and typical development) could not be precisely matched to minimize secondary influences from demographical variables. In this study, significant differences were observed in parent's and child's age, and in child's gender, when comparing between parents in the ASD and typical development groups, although these differences did not affect interpretation of study results significantly. Previous research suggested potential moderating effects of child's age and gender on parental psychological outcomes (e.g., Mandell and Salzer 2007; Smith et al. 2008). Therefore, for a more detailed understanding of the effects of demographical factors on parental stress outcomes and coping, future studies may use well-matched comparison groups or track parent responses across several time points in the child's developmental trajectory (Gray 2006; Griffith et al. 2010).

Conclusion

Parents of children with ASD experienced significantly more parenting stress and depression symptoms, and engaged in more maladaptive coping, than parents of typically developing children. While parenting stress effects were consistently observed among different groups of parents in this study, parental coping on the other hand could be sensitive to cultural influences or caregiving demands from the environment. Healthcare professionals are thus reminded to stay mindful of parents' mental health statuses and individual caregiving needs when providing services to families of children with ASD.

Acknowledgments This study is supported by a grant from the Woodbridge Hospital Charity Fund in affiliation with the Institute of Mental Health, Singapore. Special thanks to the Neuro-Behavioral Clinic (Autism Services), Child Guidance Clinic, Institute of Mental Health, for the assistance in the conduct of this study.

References

- Abbeduto, L., Seltzer, M. M., Shattuck, P., Krauss, M. W., Orsmond, G., & Murphy, M. M. (2004). Psychological well-being and coping in mothers of youths with Autism, Down Syndrome, or Fragile X Syndrome. *American Association on Intellectual and Developmental Disabilities*, 109(3), 237–254.

- Abidin, R. R. (1992). The determinants of parenting behavior. *Journal of Clinical Child Psychology, 21*(4), 407–412.
- American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Baker, J. K., Seltzer, M. M., & Greenberg, J. S. (2011). Longitudinal effects of adaptability on behavior problems and maternal depression in families of adolescents with Autism. *Journal of Family Psychology, 25*(4), 601.
- Bauman, M. L. (2010). Medical comorbidities in Autism: Challenges to diagnosis and treatment. *Neurotherapeutics, 7*(3), 320–327.
- Benson, P. R. (2010). Coping, distress, and well-being in mothers of children with Autism. *Research in Autism Spectrum Disorders, 4*(2), 217–228.
- Benson, P. R., & Karlof, K. L. (2009). Anger, stress proliferation, and depressed mood among parents of children with ASD: A longitudinal replication. *Journal of Autism and Developmental Disorders, 39*(2), 350–362.
- Carver, C. S. (1997). You want to measure coping but your protocol's too long: consider the brief COPE. *International Journal of Behavioral Medicine, 4*(1), 92–100.
- Carver, C. S. (2007). Brief COPE. Self-report measures available. Retrieved September 13, 2012 from <http://www.psy.miami.edu/faculty/ccarver/CCscales.html>.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*(2), 267–283.
- Centers for Diseases Control and Prevention (CDC). (2012). Prevalence of Autism spectrum disorders—Autism and developmental disabilities monitoring network, 14 sites, United States, 2008. *Surveillance Summaries, 61*(SS03), 1–19.
- Creswell, J. W. (2012). *Educational research: planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.
- Elsabbagh, M., Divan, G., Koh, Y.-J., Kim, Y. S., Kauchali, S., Marcín, C., et al. (2012). Global prevalence of Autism and other pervasive developmental disorders. *Autism Research, 5*, 160–179. doi:10.1002/aur.239.
- Estes, A., Munson, J., Dawson, G., Koehler, E., Zhou, X., & Abbott, R. (2009). Parenting stress and psychological functioning among mothers of preschool children with Autism and developmental delay. *Autism, 13*(4), 375–387.
- Fung, D., & Cai, Y. M. (1998). *Help your child to cope: Understanding childhood stress*. Singapore: Times Books International.
- Gallagher, S., Phillips, A. C., Oliver, C., & Carroll, D. (2008). Predictors of psychological morbidity in parents of children with intellectual disabilities. *Journal of Pediatric Psychology, 33*(10), 1129–1136.
- Gray, D. E. (2003). Gender and coping: the parents of children with high functioning Autism. *Social Science and Medicine, 56*(3), 631–642.
- Gray, D. E. (2006). Coping over time: The parents of children with Autism. *Journal of Intellectual Disability Research, 50*, 970–976. doi:10.1111/j.1365-2788.2006.00933.x.
- Griffith, G. M., Hastings, R. P., Nash, S., & Hill, C. (2010). Using matched groups to explore child behavior problems and maternal well-being in children with Down Syndrome and Autism. *Journal of Autism and Developmental Disorders, 40*(5), 610–619.
- Hall, H. R. (2012). Families of children with Autism: Behaviors of children, community support and coping. *Issues in Comprehensive Pediatric Nursing, 35*(2), 111–132.
- Hall, H. R., & Graff, J. C. (2011). The relationships among adaptive behaviors of children with Autism, family support, parenting stress, and coping. *Issues in Comprehensive Pediatric Nursing, 34*(1), 4–25. doi:10.3109/01460862.2011.555270.
- 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-age children with Autism. *Autism, 9*(4), 377–391. doi:10.1177/1362361305056078.
- Hayes, S. A., & Watson, S. L. (2012). The impact of parenting stress: A meta-analysis of studies comparing the experience of parenting stress in parents of children with and without Autism spectrum disorder. *Journal of Autism and Developmental Disorders, 43*(3), 629–642.
- Huang, Chien-Yu., Yen, Hsui-Chen, Tseng, Mei-Hui, Tung, Li-Chen, Chen, Ying-Dar, & Chen, Kuan-Lin. (2014). Impacts of autistic behaviors, emotional and behavioral problems on parenting stress in caregivers of children with Autism. *Journal of Autism and Developmental Disorders, 44*(6), 1383–1390.
- Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 78*(3), 458–467.
- Kim, B. S. K., Atkinson, D. R., & Umemoto, D. (2001). Asian cultural values and the counseling process: Current knowledge and directions for future research. *The Counseling Psychologist, 29*, 570–603.
- Konstantareas, M. M., & Papageorgiou, V. (2006). Effects of temperament, symptom severity and level of functioning on maternal stress in Greek children and youth with ASD. *Autism, 10*(6), 593–607.
- Lai, W. W., & Oei, T. P. S. (2014). Coping in parents of children with Autism spectrum disorders: A review. *Review Journal of Autism and Developmental Disorders*, doi:10.1007/s40489-014-0021-x.
- Lecavalier, L., Leone, S., & Wiltz, J. (2006). The impact of behaviour problems on caregiver stress in young people with Autism spectrum disorders. *Journal of Intellectual Disability Research, 50*(3), 172–183.
- Lee, G. K. (2009). Parents of children with high functioning Autism: How well do they cope and adjust? *Journal of Developmental and Physical Disabilities, 21*(2), 93–114.
- 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.
- Lin, C., Tsai, Y., & Chang, H. (2008). Coping mechanisms of parents of children recently diagnosed with Autism in Taiwan: A qualitative study. *Journal of Clinical Nursing, 17*(20), 2733–2740. doi:10.1111/j.1365-2702.2008.02456.x.
- Ling, C. Y. M., Mak, W. W. S., & Cheng, J. N. S. (2010). Attribution model of stigma towards children with Autism in Hong Kong. *Journal of Applied Research in Intellectual Disabilities, 23*(3), 237–249.
- Lord, C., Risi, S., Lambrecht, L., Cook, E. H, Jr, Leventhal, B. L., DiLavore, P. C., et al. (2000). The Autism diagnostic observation schedule—Generic: A standard measure of social and communication deficits associated with the spectrum of Autism. *Journal of Autism and Developmental Disorders, 30*(3), 205–223.
- Lord, C., Rutter, M., & Le Couteur, A. (1994). Autism diagnostic interview-revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders, 24*(5), 659–685.
- Lovibond, P. (2011). Depression Anxiety Stress Scales (DASS). DASS publications. Retrieved September 10, 2012 from <http://www2.psy.unsw.edu.au/groups/dass/pub.htm>.
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the beck depression and anxiety inventories. *Behaviour Research and Therapy, 33*(3), 335–343.
- Luong, J., Yoder, M. K., & Canham, D. (2009). Southeast asian parents raising a child with Autism: A qualitative investigation

- of coping styles. *The Journal of School Nursing*, 25(3), 222–229. doi:10.1177/1059840509334365.
- Mak, W. W., & Ho, G. S. (2007). Caregiving perceptions of Chinese mothers of children with intellectual disability in Hong Kong. *Journal of Applied Research in Intellectual Disabilities*, 20(2), 145–156.
- Mandell, D. S., & Salzer, M. S. (2007). Who joins support groups among parents of children with Autism? *Autism*, 11(2), 111–122.
- 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.
- Ministry of Health, Singapore (MOH). (2004). *Singapore burden of disease study 2004*. Retrieved August 02, 2013 from http://www.moh.gov.sg/content/dam/moh_web/Publications/Reports/2009/1%20Preface%20n%20Executive%20Summary.pdf.
- Moh, T. A., & Magiati, I. (2012). Factors associated with parental stress and satisfaction during the process of diagnosis of children with Autism spectrum disorders. *Research in Autism Spectrum Disorders*, 6(1), 293–303.
- Montes, G., & Halterman, J. S. (2007). Psychological functioning and coping among mothers of children with Autism: A population-based study. *Pediatrics*, 119(5), e1040–e1046.
- Mori, Kyoko, Ujiie, Takeshi, Smith, Anna, & Howlin, Patricia. (2009). Parental stress associated with caring for children with Asperger's Syndrome or Autism. *Pediatrics International*, 51(3), 364–370.
- Nevo, B., & Bin Khader, A. M. (1995). Cross-cultural, gender, and age differences in Singaporean mothers's conceptions of children's intelligence. *The Journal of Social Psychology*, 135(4), 509–517.
- Oei, T. P., Sawang, S., Goh, Y. W., & Mukhtar, F. (2013). Using the Depression Anxiety Stress Scale 21 (DASS-21) across cultures. *International Journal of Psychology*, 48(6), 1–12.
- Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, 128(1), 3–72.
- Pearson, D. A., Loveland, K. A., Lachar, D., Lane, D. M., Reddoch, S. L., Mansour, R., & Cleveland, L. A. (2006). A comparison of behavioral and emotional functioning in children and adolescents with autistic disorder and PDD-NOS. *Child Neuropsychology*, 12(4–5), 321–333.
- Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The association of coping to physical and psychological health outcomes: A meta-analytic review. *Journal of Behavioral Medicine*, 25(6), 551–603.
- Peters-Scheffer, N., Didden, R., & Korszilius, H. (2012). Maternal stress predicted by characteristics of children with Autism spectrum disorder and intellectual disability. *Research in Autism Spectrum Disorders*, 6(2), 696–706. doi:10.1016/j.rasd.2011.10.003.
- Phetrasuwan, S., & Shandor Miles, M. (2009). Parenting stress in mothers of children with Autism spectrum disorders. *Journal for Specialists in Pediatric Nursing*, 14(3), 157–165.
- Piazza, Vivian E., Floyd, Frank J., Mailick, Marsha R., & Greenberg, Jan S. (2014). Coping and psychological health of aging parents of adult children with developmental disabilities. *American Journal on Intellectual and Developmental Disabilities*, 119(2), 186–198.
- Rao, P. A., & Beidel, D. C. (2009). The impact of children with high-functioning Autism on parental stress, sibling adjustment, and family functioning. *Behavior Modification*, 33(4), 437–451.
- Sawang, S., Oei, T. P. S., & Goh, Y. W. (2006). Are country and culture values interchangeable? A case example using occupational stress and coping. *International Journal of Cross Cultural Management*, 6, 2205–2219. doi:10.1177/1470595806066330.
- Simonoff, E., Pickles, A., Charman, T., Chandler, S., Loucas, T., & Baird, G. (2008). Psychiatric disorders in children with Autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. *Journal of American Academy of Child and Adolescent Psychiatry*, 47(8), 921–929.
- Sivberg, B. (2002). Family system and coping behaviors. *Autism*, 6(4), 397–409. doi:10.1177/1362361302006004006.
- Smith, L. E., Seltzer, M. M., Tager-Flusberg, H., Greenberg, J. S., & Carter, A. S. (2008). A comparative analysis of well-being and coping among mothers of toddlers and mothers of adolescents with ASD. *Journal of Autism and Developmental Disorders*, 38(5), 876–889.
- Stuart, M., & McGrew, J. H. (2009). Caregiver burden after receiving a diagnosis of an Autism spectrum disorder. *Research in Autism Spectrum Disorders*, 3(1), 86–97.
- Szatmari, P., Archer, L., Fisman, S., Streiner, D. L., & Wilson, F. (1995). Asperger's Syndrome and Autism: Differences in behavior, cognition, and adaptive functioning. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34(12), 1662–1671.
- Taylor, S., & Stanton, A. L. (2007). Coping Resources, Coping Processes, and Mental Health. *Annual Review of Clinical Psychology*, 3, 377–401.
- Twoy, R., Connolly, P. M., & Novak, J. M. (2007). Coping strategies used by parents of children with Autism. *Journal of the American Academy of Nurse Practitioners*, 19, 251–260.
- Uchino, B. N. (2006). Social support and health: A review of physiological processes potentially underlying links to disease outcomes. *Journal of Behavioral Medicine*, 29(4), 377–387. doi:10.1007/s10865-006-9056-5.
- Wang, P., Michaels, C., & Day, M. (2011). Stresses and coping strategies of chinese families with children with Autism and other developmental disabilities. *Journal of Autism and Developmental Disorders*, 41(6), 783–795. doi:10.1007/s10803-010-1099-3.
- Yeo, K. J., & Lu, X. (2012). Parenting stress and psychological distress among mothers of children with Autism in Johor Bahru and Hangzhou. *Journal of Educational Psychology and Counseling*, 6, 129–153.