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Family functioning in Asian families raising children with autism spectrum disorders: the role of capabilities and positive meanings

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Abstract

Background There has been increasing interest in exploring the factors contributing to successful adaptation and family functioning in ethnically and culturally diverse families who raise children with autism spectrum disorders (ASD), in order to inform more appropriate strength-based family support services. This pilot study used the Family Adjustment and Adaptation Response (FAAR) model as a theoretical framework to investigate the role of families' capabilities (coping strategies and resources of support) and positive meanings in raising a child with ASD in family functioning in an Asian context.
Methods Sixty-five Singaporean parents of 3- to 11-year-old children with ASD completed a series of questionnaires on demands, coping strategies, social support, positive meanings and family functioning.
Results Families reported a number of helpful coping strategies. Coping through family integration/optimism was most helpful, followed by understanding the condition and by developing esteem and psychological stability. Reported capabilities, but not positive meanings, mediated the relationship between demands and family functioning.
Conclusion The findings are discussed in relation to existing literature, possible specific cultural issues, and the strengths and limitations of the study. Implications for supporting families of children with ASD in different social and cultural contexts are also discussed.

Keywords adjustment, autism spectrum disorders, coping, family functioning, reframing, stressors

Introduction

Autism spectrum disorders (ASD) are lifelong, complex and heterogeneous neurodevelopmental conditions affecting many domains of functioning, development and behaviour (American Psychiatric Association 2000). As such, the impact of having a child with ASD has traditionally been considered challenging for families. Parents of children with ASD have been found to experience high levels of stress, caregiver burden (i.e. Tomanik *et al.* 2004;

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Schieve *et al.* 2007; Stuart & McGrew 2008; Rao & Beidel 2009), anxiety and depression, and lower levels of family functioning than parents of children with other disabilities (i.e. Abbeduto *et al.* 2004; Eisenhower *et al.* 2005; Higgins *et al.* 2005).

Despite additional stress and challenges, available resources and support; deriving positive meanings; becoming more accepting and appreciative; acknowledging and building on strengths; and coping through their faith have all been identified as factors associated with positive family adaptation and parental well-being in both quantitative and qualitative studies (Reddon *et al.* 1992; Tarakeshwar & Pargament 2001; Hastings *et al.* 2005; Pakenham *et al.* 2005; Bayat 2007; Twoy *et al.* 2007; King *et al.* 2009). Given the importance of family, especially caregivers, in supporting their children with ASD in reaching their full potential (i.e. National Research Council 2001), it is important to better understand the factors that may facilitate families in maintaining more positive adaptation.

Understanding family adaptation in ASD through a cultural context

Although a number of similarities exist across cultures relating to factors associated with positive family functioning, there could also be potentially important differences: the values or appraisals attached to caregiving, the level of social support available and the stigma associated with disability. Tradition, philosophical, religious and other aspects of a cultural environment could partly shape how families perceive the additional challenges of parenting, their coping behaviours and use of resources or how they make sense of their experiences (Ghosh & Magana 2009). Individuals in collectivistic cultures that emphasise interdependence, group harmony and in-group relationships (such as many East Asian, South American or African cultures) may use more relationship- or emotion-focused coping compared with those in individualistic cultures who may be more likely to employ problem-focused and action-oriented coping strategies that confront and modify external stressors (Lam & Zane 2004; Chun *et al.* 2006).

Recently published research has attempted to explore ethnic and cultural similarities and differences in adjustment of families of children with ASD or other disabilities (i.e. Azar & Badr 2010; Manning *et al.* 2011; see Ghosh & Magana 2009 for a review). A number of these studies have reported that different coping strategies are used by mothers of children with ASD or intellectual disabilities (ID) in Taiwan, Ireland, Jordan and the USA (i.e. McConkey *et al.* 2008; Lin *et al.* 2011). In the USA, Latina mothers of adults with ASD reported a greater sense of obligation towards caregiving and make sense of their children's behavioural problems in different ways compared with Caucasian mothers. These differences have been hypothesised to contribute to higher reported maternal well-being and perceived positive family impact in Latina mothers (Magana & Smith 2006). In Japan, poorer quality of social support and stigma has been related to lower empowerment in caregivers (Wakimizu *et al.* 2011). Wang *et al.* (2011) reported on stressors and coping strategies of 368 families of children with disabilities in China (of which 37% were reported by caregivers to have a diagnosis of ASD). Acceptance, active coping, positive reinterpretation, suppression of competing activities and planning were reported to be their main coping strategies. The authors discussed how the families appeared to utilise both action-oriented and appraisal-focused approaches and the implications of such findings for developing culture-sensitive family support services (see also Lin *et al.* 2008 for similar findings in Taiwan).

The Family Adjustment and Adaptation Response (FAAR) model

One of the models that have been employed to understand the psychosocial impact of children's chronic conditions in families and the factors affecting family adjustment to the child's condition is the Family Adjustment and Adaptation Response (FAAR) model (Patterson 2002). The FAAR adopts a family systems perspective (Patterson & Garwick 1994) and emphasises theoretical links between family stress and resiliency. It has a number of similarities with the Double ABCX model (McCubbin & Patterson 1983; see also Manning *et al.* 2011) and consists of three components: demands, capabilities and meanings (situational appraisals). Families make dynamic efforts to balance family demands (normative and non-normative stressors, strains and daily hassles) and family capabilities (coping behaviours and sources of support). To arrive at a level of family adjustment and adaptation, the family's efforts to balance demands and capabilities are mediated by the meanings families ascribe to their events and experiences (which include shared values; family beliefs about personal relationships and the world; shared hopes, goals and expectations; Patterson 2002). According to the FAAR model, family adaptation is optimal when there is equilibrium between demands and capabilities. Conversely, family stress and maladaptation occur at times when demands outweigh capabilities. This perspective has good empirical evidence for a number of its components (see Patterson & Garwick 1994) and was employed as a conceptual framework to guide the selection of important variables for the present study because of its focus on strength-oriented family capabilities and positive meanings.

The present study: aims and research questions

This study examined demands, capabilities and meanings of raising a child with ASD in multiethnic Singapore (74.1% Chinese, 13.4% Malays, 9.2% Indians and 3.3% Others; Department of Statistics Singapore 2010a). Singapore is a traditionally Asian *and* Westernized country (Chang *et al.* 2003), where tradition and collectivism as well as fulfilling individualistic goals are valued as important (Lau 1992). This unique context may lead to both similarities and differences in reported capabilities and meanings compared with other Western or Asian caregivers. Family functioning was chosen as a measure of adaptation because of the importance of family relationships, obligations and interdependence in collectivistic Asian cultures (Yeh *et al.* 2006).

The following research questions were addressed:
(a) What were the most helpful coping strategies and sources of support employed by parents?
(b) What positive meanings did parents attribute to raising a child with ASD?
(c) What factors (demands, capabilities, positive meanings) best predict family functioning?
(d) What mediates the relationship between demands and family functioning?

Method

Participants

Sixty-five families (46 mothers and 19 fathers) of children aged 3–11 years with professional diagnoses of autism, ASD, Asperger's syndrome or pervasive developmental disorder not otherwise specified (PDD-NOS) participated in the study (see Tables 1 and 2 for parent and child characteristics). The age of parents ranged from 31 to 50 years old [M = 37.9 for mothers (*n* = 45, SD = 3.60); 42.2 for fathers (*n* = 18, SD = 5.40); two parents did not report their age]. Ages for the children ranged from 3.2 to 11.8 years (M = 6.9 years, SD = 2.1 years; one child's age was not reported). Parents reported 70.8% of the

Table 1 Characteristics of parents/families (*n* = 65 unless otherwise stated)

Characteristics of parents/families	***n* (%)**
Gender	
Female	46 (70.8)
Family composition	
Two-parent family	52 (81.5)
Extended family (grandparents, parents and children living together)	11 (16.9)
One-parent family	1 (1.5)
n children	
ASD child only	15 (23.1)
One sibling	42 (64.6)
>1 siblings	8 (12.3)
Highest education level (*n* = 64)	
At least undergraduate degree	34 (53.1)
Diploma or professional qualification	16 (25.0)
'A' level or lower	14 (21.9)
Household income (monthly)*	
>61st deciles (>S$8000)	28 (43.1)
31st–60th deciles (S$4000–8000)	27 (41.5)
1st–30th deciles (<S$4000)	10 (15.4)
Family religion	
Christian	29 (44.6)
Buddhist	13 (20.0)
None	11 (16.9)
Muslim	5 (7.7)
Others (e.g. Taoist, Hindu)	7 (10.8)

* Based on average monthly household income from work among employed households by deciles (Key household income trends, Department of Statistics Singapore 2010b, Table 4).
ASD, autism spectrum disorder.

Table 2 Child characteristics ($n = 65$ unless otherwise stated)

Child characteristics	*n* (%)
Gender	
Male	60 (92.3)
Ethnicity	
Chinese	50 (76.9)
Malay	5 (7.7)
Indian	2 (3.1)
Others (i.e. Filipino, Eurasian)	8 (12.3)
Diagnosis ($n = 63$)	
ASD	46 (73.0)
Autistic disorder	12 (19.0)
Asperger's syndrome	3 (4.8)
PDD-NOS	2 (3.2)
Comorbid medical conditions ($n = 15$; 23.1%)	
Visual/hearing impairment	5
Epilepsy	4
Others (e.g. G6PD, VSD)	6
Education	
Mainstream	22 (33.9)
Special	27 (41.5)
Mainstream and special	3 (4.6)
Others (e.g. early intervention programmes, speech therapy, ABA)	13 (20.0)
Parent-reported intellectual disability (ID)	
No ID	40 (61.5)
Mild ID	6 (9.2)
Moderate ID	10 (15.4)
Severe ID	2 (3.1)
Unsure/no response	7 (10.8)
Child's communication level ($n = 63$)	
No speech	6 (9.5)
<50 words	13 (20.6)
Phrase/short sentences	18 (28.6)
Conversational speech	26 (41.3)

ASD, autism spectrum disorder; PDD-NOS, pervasive developmental disorder not otherwise specified; G6PD, glucose-6-phosphate dehydrogenase; VSD, ventricular septal defect; ABA, applied behavioural analysis.

children being diagnosed in Child Development Units (CDUs) in Singapore's public hospitals; the remaining children were privately diagnosed. Children under 7 years old are typically referred to CDUs to be assessed by a consultant paediatrician, who obtains a detailed developmental history from the parents and observes the child. Children suspected of ASD are then comprehensively assessed in terms of cognitive, adaptive behaviour and communication functioning by child psychiatrists and psychologists; gold standard diagnostic tools are often employed, including the Autism Diagnostic Observation Schedule (ADOS) and/or the Autism Diagnostic Interview-Revised (ADI-R), which are administered by trained psychologists or paediatricians. Final clinical diagnoses of ASD are made after considering all sources of information with all professionals involved in the assessment as a multidisciplinary team. Mean children's age at time of diagnosis was 35.3 months (SD = 11.8 months; $n = 64$; consistent with recent findings of mean age of ASD diagnosis in Singapore, see Moh & Magiati 2012). Participants took part in this study on average 45.2 months after diagnosis (SD = 26.3, range 3 months to 9 years 1 month). Participating families were generally ethnically representative of the Singapore population (Chinese 76.9%, Malay 7.7%, Indian 3.1%, Others 12.3%).

Procedure

Ethical approval was obtained from the National University of Singapore Institutional Review Board. Special schools, one CDU, intervention centres, voluntary welfare and other private organisations providing services for children with ASD and their families in Singapore were informed about the study and inclusion criteria (i.e. 3- to 12-year-old children with a professional diagnosis of ASD), before permission was granted for survey packages (including the measures, participant information sheet and consent form) to be distributed to caregivers. Participating organisations were advised to distribute the measures to all caregivers that met the study's inclusion criteria as far as possible. The questionnaires were completed in English, the main language of instruction and administration, with 80% of Singaporeans literate in the language (Department of Statistics Singapore 2000, 2010c). Sixty-six questionnaires out of a total of 420 that were handed out to participating organisations for distribution were returned by mail to the first author (or in person to the professional in the participating organisation, who then forwarded to the first author); one participant was excluded as the child was below 3 years of age (final $n = 65$).

Measures

All measures were carefully chosen to assess family stress and demands, capabilities and meanings, conceptualised as important adjustment and adaptation factors in the FAAR model. Every effort was made to select measures that have good psychometric properties and that have commonly been employed in stress and coping research with families of children with disabilities, including ASD, in different countries and ethnic groups. However, it should be noted that the measures chosen have not been validated in Singapore and thus scores obtained should be interpreted with some caution. Currently, no validated measures of the constructs of interest to this study exist for this population.

Parental stress

Parents were asked to complete all 31 true–false statements from the Parent and Family Problems and the Pessimism sub-scales of *The Questionnaire on Resources and Stress – Friedrich Short Form* (QRS-F; Friedrich *et al.* 1983), a measure used widely with families of young people with disabilities, including ASD. Example items include ‘our family agrees on important matters’ and ‘in the future, our family’s social life will suffer because of increased responsibilities and financial stress’. Responses are coded 1 or 0, with higher scores reflecting higher stress levels. The QRS-F is very highly correlated with its long form ($r = 0.98$); has internal consistency of 0.85–0.93 and good convergent validity with the Beck Depression Inventory and other adaptation, coping and autism severity measures (Honey *et al.* 2005). It has often been used in studies of families of children with ASD (i.e. Honey *et al.* 2005; Osborne *et al.* 2008).

Coping strategies

The Coping Health Inventory for Parents (CHIP; McCubbin *et al.* 1981) is a 45-item parent-report questionnaire developed to assess the behaviours caregivers use to cope with their child with chronic illness or disability. It is organised in three subscales: (1) family integration, co-operation and an optimistic definition of the situation (e.g. ‘Doing things together as a family’); (2) maintaining social support, self-esteem and psychological stability (e.g. ‘Building close relationships with people’); and (3) understanding the medical situation through communication with other parents and consultation with medical staff (e.g. ‘Talking with the medical staff when we visit the medical centre’). Parents rated the degree of each behaviour’s helpfulness using a four-point Likert scale (from 0 = *not helpful* to 3 = *extremely helpful*) or otherwise ticked *chose not to use* or *not possible*. A higher score indicates the coping strategy is perceived as more helpful. Each sub-scale has alpha reliabilities of 0.79, 0.79 and 0.71 respectively. The measure has been well validated with other standardised questionnaires of family environment and changes in child’s health (McCubbin *et al.* 1981) and has often been used in family stress or coping research in ASD (i.e. Gray & Holden 1992; Lee 2009; Hall & Graff 2011).

Positive meanings

Parents were asked to rate (from 1 = *not at all* to 4 = *substantial degree*) 10 items of the Positive Family Impact (PFI) sub-scale of the *Family Impact of Childhood Disability Scale* (FICD; Trute *et al.* 2007), which assesses positive subjective interpretations and personal appraisals of parents in relation to the family impact of their child’s disability. Higher scores indicate more positive appraisals of the impact of ASD on the family. An example of an item is ‘the child’s disability has led to positive personal growth, or more strength as a person in mother and/or father’. Test–retest reliability of the PFI is 0.92 and alpha coefficients are 0.81 for mothers and 0.85 for fathers. The scale has good reported psychometric properties, including predictive validity for mothers of children with disabilities at risk for poor psychosocial well-being (Benzies *et al.* 2011). In addition, parents were also asked to state in their own words the positive changes that have occurred in their family in an open-ended question of the child and family background questionnaire (see Child and family background questionnaire).

Child and family background questionnaire

An eight-page questionnaire was developed for the purposes of this study to gather information about the child (Section A: age, gender, ethnicity, diagnosis, education, other difficulties, communication, behaviour); the family (Section B: family status, education and occupation of parents, caregiving arrangements, number of siblings, sources of support) and stressful life events the family has experienced in the past year based on items of the *Family Inventory of Life Events and Changes* (FILE; McCubbin *et al.* 1983).

Family functioning as a measure of family adaptation

The *Family Adaptability and Cohesion Evaluation Scales IV* (FACES IV; Olson *et al.* 2007) measure family cohesion, flexibility and communication and consist of 62 items across eight sub-scales: Balanced Cohesion; Balanced Flexibility; Disengaged; Enmeshed; Rigid; Chaotic; Family Communication; and Family Satisfaction. For this study, only the Balanced Cohesion, Balanced Flexibility, Family Communication and Family Satisfaction sub-scales were analysed, as the two balanced sub-scales are highly and negatively correlated with their corresponding unbalanced sub-scales (Disengaged, Enmeshed, Rigid and Chaotic). Ratings in the included sub-scales range from 1 (*strongly disagree*) to 5 (*strongly agree*) with higher scores indicating better family functioning. The balanced sub-scales have concurrent validity with three other family assessment scales and good alpha reliabilities (Olson *et al.* 2007). Test–retest reliabilities of Family Communication and Family Satisfaction are 0.86 and 0.85 respectively (Olson 2010). The scale has been used in prior studies to assess adaptation in families of children with ASD (i.e. Higgins *et al.* 2005; Baker *et al.* 2011).

Missing data and statistical analysis

Missing data for completed measures were minimal. For QRS-F (1.8% missing items), missing responses were given a conservative code of 0.5 to reflect a response between true and false. Missing items were substituted with the mean rating for each sub-scale[1] for FACES IV (0.05% missing items), CHIP (0.4% missing items) and FICD (0.5% missing items). The small variations in reported sample size in Tables 3–5 could be explained by participants not completing all measures (CHIP = 1; FICD = 3; FACES = 2). To minimise repeated statistical comparisons in a relatively small sample size, a Total Demands score (QRS-F stress score + parent-reported child functioning and behaviour severity score[2] + pile up of demands score[3]), Total Capabilities score (CHIP total + N of social support sources reported) and a Total Family Functioning score (Balanced cohesion + Balanced flexibility + Family Communication + Family Satisfaction) were calculated. These 'total' scores were developed as all four sub-scales of family functioning were highly correlated with large effect sizes with one another (all $0.59 < r < 0.82$, all $P < 0.01$); QRS-F stress score and child functioning and severity score were also significantly correlated with a medium effect size ($r = 0.33$, $P < 0.01$). Pile up of demands score did not correlate significantly with QRS-F stress or child functioning scores ($r = 0.17$, $P = 0.18$; and $r = -0.052$, $P = 0.68$ respectively), which was expected as additional life events (i.e. losing a job, moving house, death in the family) tend to be independent of the child's disability; pile up of demands was also included in the Total Demands score. Finally, although CHIP total and N of social support sources reported did not significantly correlate with one another ($r = 0.14$, $P = 0.29$), which may have been due to the small range of values in measuring social support resources, both were included in the Total Capabilities score, as conceptually they independently contribute to the family's strengths and resources.

Mann–Whitney *U*-tests showed no statistically significant differences between mothers and fathers, thus data from all parents were analysed together. First, Pearson *r* correlations between the variables of interest and family functioning were performed to explore significant relationships for inclusion in subsequent regression analyses (see Table 5). As adaptation is a process through time, time since diagnosis was also included in our correlation analyses.

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[1] Total score divided by the total number of completed items.

[2] Child functioning and behaviour severity score was calculated as follows: *additional medical condition* (1 = yes) + *intellectual disability* (1 = yes) + *communication* (2 = <50 words, 1 = phrase speech, 0 = conversational/age appropriate) + *stereotyped behaviour* (4 = often, 3 = sometimes, 2 = occasionally, 1 = rarely) + *aggressive/self-injurious behaviour* (1 = yes) = total score ranging from 1 to 9 (higher scores indicate more difficulties).

[3] Pile up of demands was calculated as follows: *average monthly income* (2 = <S$4000, 1 = S$4000–8000, 0 = >S$8000; Department of Statistics Singapore 2010b) + *other child with medical/developmental condition* (1 = yes) + *other stressful events* (1–12 points for every additional single stressor reported, 0 = no additional stressors reported) = total score ranging from 0 to 15 (higher scores indicating more demands and stressors).

Table 3 Descriptive statistics

Domain	Variable	*n*	M	SD	α	Range	
						Measure	Our sample
Demands	Perceived stress (QRS-F)	65	12.5	6.79	0.89	0–31	0–27
	Autism severity	63	4.02	1.83		1–9	1–8
	Pile up of demands*	61	1.70	1.50		0–15	0–7
	Total demands	59	17.9	7.78		1–55	3–35
Capabilities and resources	Family integration, co-operation, optimistic definition	64	39.8	9.10	0.88	0–57	17–55
	Maintaining social support, self-esteem and stability	64	30.6	10.5	0.89	0–54	5–54
	Understanding the health-care situation	64	15.6	4.26	0.75	0–24	6–24
	Total CHIP	64	86.3	21.9	0.94	0–135	33–133
	Social support resources	64	2.84	1.51		0–8	0–7
	Total capabilities	63†	89.2	22.3		0–143	36–135
Positive meanings	FICD	62	31.5	6.19	0.89	10–40	10–40
Family functioning	Cohesion	63	28.5	3.33	0.77	7–35	20–35
	Flexibility	63	25.9	2.88	0.56	7–35	19–34
	Family communication	63	37.7	5.60	0.88	10–50	23–48
	Family satisfaction	63	34.1	6.53	0.95	10–50	20–50
	Total family functioning (cohesion + flexibility + communication + satisfaction)	63	126.2	16.2		34–170	84–159

* Of 33 parents who reported at least one stressor this year, financial difficulties (*n* = 10, 15.4%) and a family member embarking on a new job or school (*n* = 7, 10.8%) were most often reported.
† Two parents excluded because of missing responses.
QRS-F, The Questionnaire on Resources and Stress – Friedrich Short Form; CHIP, The Coping Health Inventory for Parents; FICD, Family Impact of Childhood Disability Scale.

Table 4 Most frequently reported coping behaviours (*n* = 64)

Coping behaviour	Extremely helpful (%)
Trusting my spouse to help support me and my child(ren)	48 (73.8)
Telling myself that I have many things I should be thankful for	39 (60.0)
Doing things together as a family	38 (58.5)
Becoming more self-reliant and independent	33 (50.8)
Talking over personal feelings and concerns with spouse	33 (50.8)
Doing things with my children	32 (49.2)
Talking with other parents in the same type of situation and learning about their experiences	31 (47.7)
Trying to maintain family stability	28 (43.1)
Investing myself in my child(ren)	26 (40.0)
Reading about how other persons in my situation handle things	26 (40.0)

Finally, capabilities (coping and resources) and positive meanings as potential mediators of the relationship between demands and family functioning were examined. Two mediation analyses were carried out using the bootstrapping technique, which does not assume normal distribution, thus improving statistical power in a small sample size (Preacher & Hayes 2008).

Results

Descriptive statistics with Cronbach's alpha for each measure are presented in Table 3.

Demands faced by families

In the child and family background questionnaire, parents reported low to moderate levels of child ASD severity (see Missing data and statistical

Table 5 Correlations between time since diagnosis, demands, capabilities, positive meanings and family functioning ($n = 57$)

	Time since diagnosis	Age of child (months)	Total demands	Total capabilities	Positive meanings	Total family functioning
Time since diagnosis	–					
Age of child (months)	0.90**	–				
Total demands	0.31*	0.30*	–			
Total capabilities	–0.056	–0.09	–0.43**	–		
Positive meanings	0.13	0.06	–0.15	0.47**	–	
Total family functioning	–0.057	–0.12	–0.52**	0.46**	0.24	–

* $P < 0.05$, ** $P < 0.01$.

analysis footnote for a reminder of how this was calculated) and few additional life stressors experienced in the last year; they also reported relatively low levels of stress on the QRS-F (see Table 3). One-third of the children were identified by their parents as having an ID and 40% were reported to use conversational or age appropriate speech, which indicated that this sample is likely to be within the mild–moderate range of functioning for this population (Howlin 1998). Stereotyped, aggressive or self-injurious behaviours were reported by the majority of parents to occur occasionally and to cause little or some interference in everyday family life.

Capabilities

Coping strategies

Mean scores of ‘family integration/optimism’ and ‘understanding the condition’ in our sample were not significantly different from CHIP normative scores of 308 mothers[4] of chronically ill children in these sub-scales [one sample $t(63) = -0.17$, $P = 0.87$, $d = 0.013$ for ‘family integration’; one sample $t(63) = 1.06$, $P = 0.30$, $d = -0.086$ for ‘understanding the condition’; McCubbin *et al.*, 1981]. For ‘esteem/psychological stability’, our sample mean of 30.6 indicated higher self-reported stability than normative scores of mothers with a small effect size [one sample $t(63) = 2.02$, $P = 0.048$, $d = -0.22$; McCubbin *et al.* 1981].

The 10 coping behaviours most frequently reported by caregivers as helpful are listed in Table 4. As the three CHIP sub-scales consist of unequal number of items, every sub-scale score was divided by its corresponding number of items to obtain a mean rating that could be compared across sub-scales. In our sample, coping strategies focusing on family integration/optimism (M = 2.10, SD = 0.48) were most helpful, followed by understanding the condition (M = 1.95, SD = 0.53) and by esteem/psychological stability (M = 1.70, SD = 0.58).

Sources of support

On average, parents reported two to three sources of support, most commonly the immediate family, followed by school; other families of children with ASD; professionals; and the extended family (see Fig. 1).

Positive meanings

Parents’ responses to the open-ended question ‘tell us what are some positive changes in your family from raising a child with ASD’ in the child and family background questionnaire were extracted and organised into categorical themes. Sixty-one per cent of responses reflected personal and/or family growth: parents reported becoming more patient, appreciative, accepting, understanding and supportive towards their own child and those with disabilities. Parents also mentioned strengthened relationships with spouses and other family members (24.7%) and a positive drive to do the best for their child (14.3%).

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[4] We compared our sample means with norms obtained from mothers, as 70% of our respondents were mothers.

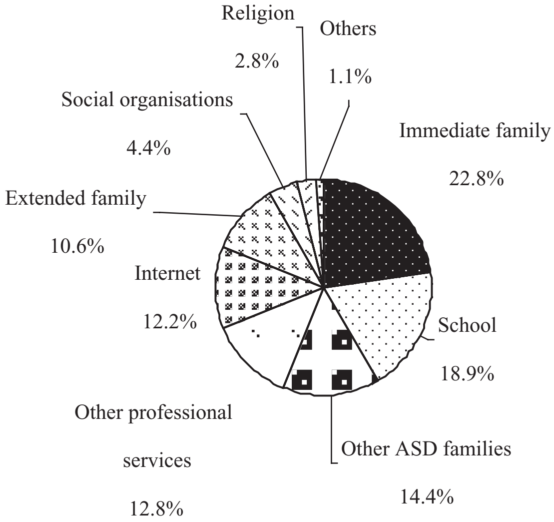

Figure 1 Main sources of support ($n = 63$). ASD, autism spectrum disorder.

Family functioning

Most families in our sample were classified as Very Connected ($n = 32$, 49.2%) or Connected ($n = 32$, 47.7%) in the FACES-IV Balanced Cohesion subscale; and Flexible ($n = 51$, 78.5%) or Very Flexible ($n = 12$, 18.5%) in the Balanced Flexibility subscale. The mean of 37.7 in the Family Communication score was only slightly higher than the norm mean of 36.2 obtained by 2465 people from the US general population [one sample $t(62) = 2.06$, $P = 0.044$, $d = -0.17$; Olson, 2010]. Our sample of families reported somewhat less family satisfaction (M = 34.1) than the norm [M = 37.9; one sample $t(62) = -4.59$, $P < 0.001$, $d = 0.45$; Olson 2010]. Despite being cohesive and flexible, 26 families also reported themselves as moderately rigid (40.0%).

Predictors of family functioning and adaptation

Parents who reported more demands also reported less use of coping behaviours and sources of support and less optimal family functioning. Parents with higher reported capabilities were also more likely to identify more positive meanings in raising their child with ASD. Time since diagnosis and children's age were positively associated with Total Demands, but there was no association between these variables and family functioning. A significant positive association with a medium effect size was found between Total Capabilities and Family Functioning (Table 5). The relationship between Positive Meanings and Family Functioning was positive, of a small effect size ($r = 0.24$) and approached, but did not quite reach, statistical significance ($P = 0.058$). This was most likely due to a lack of power. Based on power calculation, only six additional participants would be required for this correlation to be statistically significant at $P < 0.05$ and as there was a medium and significant correlation between positive meanings and capabilities, Positive Meanings was still included in subsequent hierarchical regression analyses.

In order to explore unique and shared contributions of demands, capabilities and positive meanings in predicting family functioning, Total Demands was entered first in the regression, followed by Total Capabilities and Positive Meanings. Parents' gender and family status (i.e. single families) were not included because of little variation in our sample (e.g. one single parent family; 70% of respondents were mothers). Overall, the model accounted for 35.3% of the variance in family functioning [$n = 59$; $F(3,56) = 10.2$, $P < 0.001$]. Most of this variance (29.2%) was explained by Total Demands, with Total Capabilities accounting for another additional 5.6% of variance, which was also significant ($P = 0.031$). When all variables were considered together, Total Capabilities ($\beta = 0.2$, $t = 1.4$, $P = 0.16$) and Positive Meanings ($\beta = 0.12$, $t = 0.99$, $P = 0.33$) did not make significant unique contributions to the variance in family functioning over and above that of Total Demands ($\beta = -0.42$, $t = -3.45$, $P = 0.001$). When Total Capabilities and Positive Meanings were entered as the first and second block respectively in another hierarchical regression with only the strength-focused variables, Total Capabilities accounted for 20.1% of the variance in family functioning [$F(2,57) = 7.40$, $P = 0.001$]. Positive Meanings accounted for an additional 0.5% of the variance ($\beta = 0.08$, $t = 0.59$, $P = 0.55$), which was not a significant unique contribution in predicting family functioning over and above Total Capabilities ($\beta = 0.41$, $t = 3.08$, $P = 0.003$).

In the mediation analysis, the direct effect of Total Demands on family functioning was −0.83 [$n = 62$; indirect effect with total capabilities score as a mediator = −0.25; 95% confidence intervals (CI)

(–0.54, –0.08), $P < 0.05$]; thus, Total Capabilities mediated the relationship between Total Demands and family functioning. The direct effect of Total Demands on family functioning was –0.68 [indirect effect with positive meanings as a mediator = –0.04, 95% CI (–0.24, 0.02), non-significant]. Positive meanings did not mediate the relationship between Total Demands and family functioning.

Discussion

This pilot study used the FAAR model as a theoretical framework to explore the role of parent reported family coping behaviours, resources and positive meanings in family functioning in an ethnically diverse sample of Singaporean families raising children with ASD. Overall, families in our sample reported relatively low levels of stress, a finding generally not consistent with a number of other studies indicating high levels of reported parental stress (i.e. Hastings *et al.* 2005; Lecavalier *et al.* 2006), but similar to other reported findings (i.e. Honey *et al.* 2005). Most parents in our sample reported that their children had a diagnosis of ASD *without* ID, additional medical conditions or severe stereotyped or aggressive behaviours, all of which have consistently been associated with increased parental stress (Abbeduto *et al.* 2004; Lecavalier *et al.* 2006). Although based on parent report and not standardised measures of cognitive functioning or behaviour, these characteristics, together with higher socioeconomic and educational status in our sample, might to some extent explain the relatively low levels of demands and stress reported.

Family capabilities and resources

Families in this sample had somewhat higher mean esteem and psychological stability coping abilities than CHIP norms of mothers of children with chronic illness (McCubbin *et al.* 1981), but similar average scores to 97 US mothers of 2- to 18-year-old children with pervasive developmental disorder (Tobing & Glenwick 2006). The main coping patterns reported involved family integration, co-operation and being positive about the future as well as taking steps to gain knowledge about ASD through professionals and other families (cf. Reddon *et al.* 1992), indicating that parents employed both problem-focused and emotion-focused coping. This finding is consistent with that of Wang *et al.* (2011), who also reported that families of children with autism and other developmental disabilities in China employed both active coping strategies (such as planning, seeking services or suppressing competing activities) and relationship/family-oriented approaches and acceptance/positive reinterpretation in adjusting to the demands of caring for a child with ASD or another developmental disability (see also Lin *et al.* 2011 for comparable findings on Taiwanese mothers). Furthermore, in our Singaporean sample, a country that is both Westernised and traditionally Asian, our findings provide some further support to views that coping styles may be more related to cultural orientation and acculturation, rather than race or ethnicity *per se* (Yeh *et al.* 2006).

Compared with the other two CHIP sub-domains, our sample scored higher in the family integration/optimism sub-domain, providing support for the importance of spouse and family, the collectivistic orientation and the tendency to use reframing in Asian populations (Yeh *et al.* 2006; Twoy *et al.* 2007; Ghosh & Magana 2009).

The mean number of social support resources reported by parents in this study was 2.84, similar to Irish, Jordanian and Taiwanese mothers in McConkey *et al.* (2008). Reliance on professional services was also important, possibly tied to coping by understanding the child's condition and a general respect for authority in those with a collectivistic orientation (Yeh *et al.* 2006).

The percentage of parents who reported seeking or receiving support from other families/caregivers of children with ASD (14.4%) was much lower than that reported by parents in the UK (47%; Cassidy *et al.* 2008) and the USA (93%; Twoy *et al.* 2007), although sample characteristics might account for some of these differences. Given the recent emphasis in utilising technology-assisted sources of information and support, the use of the Internet as a source of support was surprisingly low (12.2%) in our sample compared with the 44% reported by Mackintosh *et al.* (2006) online survey of 498 parents of children with ASD from the USA, the UK, Canada, New Zealand, Australia and Ireland, considering that home Internet access in Singaporean households is 82% (Infocomm Development Authority of Singapore 2010) and given the relatively average or above average educational level of our families. To some extent, this may be explained by traditional beliefs that family issues should remain and be resolved within the family; furthermore, it has been shown that collectivistic individuals, because of their desire to protect the well-being of the 'in-group' and to 'save face', may be more likely to rely on themselves and their immediate family members as sources of support (Taylor *et al.* 2004).

Positive meanings

Our parents appeared to report somewhat higher mean positive meanings associated with the impact of their child with ASD as measured by the FICD than parents in Canada (i.e. Trute *et al.* 2007; King *et al.* 2009). Although family and child characteristics varied across the studies (e.g. Trute *et al.* in 2007 assessed the *early* positive appraisal of the impact of pre-school children's disability on the family; King *et al.* in 2009 examined positive impact and meanings at times of transition to elementary/high school), which could explain some of the differences found, these could also, at least to some extent, be explained by culture. For example, the Confucian value of growth in families through staying together to weather challenges and adversity (Tweed & Conway 2006; Chang & Hsu 2007) and predominantly collectivistic cultures' emphasis on secondary control coping (changing one's perspective to adjust to the environment and restore harmony) might affect how some Asian families make sense of the impact of ASD on their family (see also Lam & Zane 2004; Yeh *et al.* 2006; Mak & Ho 2007). At the same time, the content of positive meanings reported, focusing on acceptance, appreciation and family unification, was similar to most studies with Western samples (i.e. Bayat 2007; King *et al.* 2009).

Family functioning

On the whole, families in our sample reported overall adaptive family functioning with lower mean cohesion and flexibility scores compared with those reported by other parents of children with autism (i.e. Gau *et al.* 2012). In addition, the reported use of a number of helpful coping strategies, resources and positive reframing suggested resilience in the families in this sample. It is interesting that 40% of these families also presented with moderate levels of rigidity probably as a consequence of emphasis on adherence to family rules (Olson & Gorall 2006), a common practice in many Asian cultures (Chan & Lee 2004). Thus, families reported flexibility while simultaneously respecting more 'traditional' authoritarian parenting practices. Some rigidity in family life might also be a realistic adaptation to the need for structure and routine in ASD.

The significant associations of Total Demands, Total Capabilities and Positive Meanings with family functioning provided some support for the application of the FAAR model in ethnically diverse Asian families of children with ASD, although positive meanings' relationship to family functioning was found in this sample to be of a small effect size. Contrary to the reported importance of reframing in Asian and other cultures (i.e. Twoy *et al.* 2007; Ghosh & Magana 2009; Manning *et al.* 2011), our study found that what the parents *do* and *who they turn to* (capabilities) appeared to be more important buffers of demands on family functioning than the positive appraisals they make. This difference regarding the importance of reframing could be explained by measure or sample differences. At the same time, positive meanings and capabilities were highly correlated indicating that they were likely to be interrelated strength factors.

Strengths and limitations of the study

This pilot study adds to a growing body of research with a strength-based approach to understanding the needs of families of children with ASD in different socio-cultural contexts. However, our cross-sectional methodology might not yield as accurate or rich information as longitudinal studies in measuring family functioning, which changes over time, nor was it able to draw causal inferences on families' pre-diagnosis functioning and capabilities and how these might have affected the process of adaptation subsequently. Our recruitment efforts were challenged both at the organisational and at the individual level (given the small geographical location and population, many organisations and parents receive numerous requests for research participation; some parents might have preferred to complete the survey in Mandarin and thus did not respond to the English questionnaires). The resulting low survey return rate and a sample that is likely to include a higher percentage of more functionally able children and families from middle and higher socio-economic backgrounds might limit the generalisability of our findings to families with similar characteristics. Other reasons could be self-selection, recall bias or social desirability, although the latter appears less likely given that the questionnaires were anonymous. Although a validated measure of the child's functioning and behaviour was not used because of budget constraints and concerns regarding the length of the survey, the information collected from parents in the demographic/child questionnaire provided some information on ASD severity and allowed us to calculate an approximate functioning severity score (see Missing data and statistical analysis).

Implications for future research and practice

Future studies should consider a comprehensive longitudinal assessment of adaptation and family functioning using different methodologies and a valid measure of child's functioning. More in-depth mediation analyses, taking into account demographic or ethnic characteristics, should also be carried out (see Lin *et al.* 2011 for a recent example of such investigations), to explore specific factors buffering the effects of increased demands and stress on family functioning.

Our pilot findings provide initial support for the importance of continuing to develop and improve family support services tailored to meet the specific needs of culturally and ethnically diverse families of children with ASD. Such services should focus on recognising and promoting families' positive coping behaviours and increasing the quantity and quality of, and access to, available resources of support to foster stronger and more adaptive family functioning. The limited additional independent contribution of positive meanings in our study could suggest that perhaps strengthening positive appraisals may need to be targeted *together with* or *following* efforts to strengthen capabilities. Awareness of the specific cultural values that affect attitudes and caregiving practices is important to promote more effective culturally sensitive working relationships between families and professionals for healthier family adaptation; relationship-oriented coping may be a relevant and appropriate target for some Asian families. Other potential targets could be the promotion and use of web-based support and increasing ties between families of children with ASD in the same communities, although the values and beliefs of the families in relation to whether 'out-group' support is wanted or considered helpful need to be considered. However, as stressors and demands were the most important single variable predicting family functioning; professional efforts should continue to systematically and consistently assess, address and alleviate stress in families of children with ASD (Stuart & McGrew 2008).

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