

# World Journal of *Psychiatry*

*World J Psychiatr* 2019 March 27; 9(2): 30-46



**ORIGINAL ARTICLE****Observational Study**

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Responsible Electronic Editor: *Ying-Na Bian*      Proofing Editorial Office Director: *Jin-Lei Wang*

**NAME OF JOURNAL**

*World Journal of Psychiatry*

**ISSN**

ISSN 2220-3206 (online)

**LAUNCH DATE**

December 31, 2011

**FREQUENCY**

Monthly

**EDITORS-IN-CHIEF**

Rajesh R Tampi

**EDITORIAL BOARD MEMBERS**

<https://www.wjnet.com/2220-3206/editorialboard.htm>

**EDITORIAL OFFICE**

Jin-Lei Wang, Director

**PUBLICATION DATE**

March 27, 2019

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<https://www.wjnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

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## Observational Study

## Parenting preschoolers with autism: Socioeconomic influences on wellbeing and sense of competence

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**Author contributions:** Mathew NE, Burton KLO, Schierbeek A, Črnčec R, Walter A, Eapen V contributed to this paper.

**Institutional review board**

**statement:** The collection of information for this study was approved by the Human Research Ethics Committee at the University of New South Wales, Sydney, Australia.

**Informed consent statement:**

Families provided informed consent for any information collected as part of a broader study of an early intervention program for Autism Spectrum Disorders to be discussed and published provided that all information included in any publication is anonymised such that they cannot be personally identified.

**Conflict-of-interest statement:**

None.

**STROBE statement:** The authors have read the STROBE Statement-checklist of items, and the manuscript was prepared and revised according to the STROBE Statement-checklist of items.

**Open-Access:** This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external

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**Abstract****BACKGROUND**

Previous research suggests that parents raising a child with autism experience higher levels of psychological distress than parents of typically developing children and parents of children with other developmental disorders. Little is known, however, about the intersection between the effects of socioeconomic status (SES) on the wellbeing and sense of parental competency of parents of preschoolers with autism and how it relates to child symptom severity.

**AIM**

To examine the relationship between their child's symptom severity, SES, as measured by neighbourhood advantage and occupational status, on the psychological wellbeing and perceived parenting competence among parents of preschoolers with autism.

**METHODS**

Parents of 117 preschool-aged children with a diagnosis of autism spectrum disorder (ASD), 107 mothers and 54 fathers, completed questionnaires about their child's symptoms of ASD and functioning, their own perceptions of their wellbeing and parental competence on entry to an early intervention program in Sydney, Australia. Parents also provided demographic information pertaining to their occupation, level of education attained and address (postcode). All children were also assessed for their severity of symptoms using the Autism Diagnostic Observation Schedule. The Australian Socioeconomic Index of occupational

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**Manuscript source:** Invited manuscript

**Received:** May 29, 2018

**Peer-review started:** May 29, 2018

**First decision:** July 9, 2018

**Revised:** February 5, 2019

**Accepted:** February 18, 2019

**Article in press:** February 19, 2019

**Published online:** March 27, 2019

status as a measure of familial SES and the Index of Relative Socio-economic Advantage and Disadvantage as a measure of neighbourhood advantage were used to examine the impact of SES on parental sense of competence and wellbeing.

## RESULTS

Compared to normative populations, both mothers and fathers in our sample reported significantly higher levels of parenting sense of efficacy but lower levels of interest in the parenting role. Mothers also displayed higher levels of satisfaction. Both mothers and fathers displayed higher levels of depression than normative populations with mothers also reporting greater levels of stress and anxiety. Child symptom severity was associated with maternal parenting competency with these relationships amplified among mothers with higher familial SES and who lived in areas of greater neighbourhood advantage. Increased adaptive functioning was associated with better maternal wellbeing, particularly among mothers who lived in areas of greater neighbourhood advantage. Contrastingly, paternal parenting competence was generally not influenced by child adaptive functioning or symptom severity, although for those in higher familial SES brackets, children's symptom severity and maladaptive symptoms were negatively related to paternal sense of parenting efficacy. There was a trend towards moderate relationships between lower familial SES and greater depression, stress and anxiety among fathers, but no relationship with their child's ASD symptom severity or functioning.

## CONCLUSION

SES differentially impacts wellbeing and sense of parenting competence and its relationship to the impact of child symptoms for mothers and fathers of preschoolers with autism.

**Key words:** Wellbeing; Parenting competency; Autism; Autism spectrum disorder; Parent; Mother; Father; Socioeconomic status

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**Core tip:** Previous research suggests that parents raising a child with autism experience comparatively higher levels of psychological distress than other parents. Little is known, however, about how socioeconomic status (SES) affects perceived parenting competence and overall wellbeing and how these factors relate to the nature of children's autism. In this study, a cross-sectional analysis of parents of preschoolers with autism found that mothers and fathers were differentially affected by SES and their children's symptom severity. Those working with parents of pre-schoolers with autism need to consider differential effects of factors, such as SES and symptom severity, in contributing to maternal and paternal wellbeing and their experiences of parenting.

**Citation:** Mathew NE, Burton KLO, Schierbeek A, Črnčec R, Walter A, Eapen V. Parenting preschoolers with autism: Socioeconomic influences on wellbeing and sense of competence. *World J Psychiatr* 2019; 9(2): 30-46

**URL:** <https://www.wjgnet.com/2220-3206/full/v9/i2/30.htm>

**DOI:** <https://dx.doi.org/10.5498/wjp.v9.i2.30>

## INTRODUCTION

Autism spectrum disorder (ASD) is a life-long neurodevelopmental disorder characterised by deficits in communication and social interaction, and restricted, repetitive patterns of behaviour, activities or interests<sup>[1]</sup>. The prevalence of ASD appears to be rising worldwide<sup>[2]</sup> with autism currently estimated to affect around one in every 59 children aged 8 years old<sup>[3]</sup>. Parenting children with autism can be physically, psychologically, socially and financially demanding<sup>[4,5]</sup>.

Parents of children with autism face multiple challenges such as difficulties associated with the diagnostic process, finding appropriate intervention and

educational programs, managing symptoms and behaviour on a daily basis, stressors further compounded by the financial burden due to the high cost of services<sup>[6-8]</sup>. Consequently parents of children with autism have been reported to show clinically elevated stress levels, poorer mental and physical health and lower quality of life across a range of studies<sup>[9-12]</sup>. A meta-analysis of 16 studies found higher levels of psychological distress among parents of children with autism relative to parents of children with other neurodevelopmental disabilities and medical conditions<sup>[10]</sup>. In addition to the impact on parental wellbeing, high levels of parenting stress have been found to reduce the effectiveness of a range of early interventions<sup>[13]</sup> and increase the use of ineffective parenting strategies that contribute to a decrease in the child's executive functioning and an increase in behavioural regulation problems<sup>[14]</sup>.

Parenting sense of competence is a construct that has emerged as having a significant impact on parental wellbeing among parents of children with autism. Greater scores on dimensions of parenting competence including parents' satisfaction with the role of parents and perceived self-efficacy is associated with improved parental wellbeing<sup>[12,15,16]</sup>. The limited research to date suggests no difference in perceived satisfaction with the parenting role and a third dimension, interest and engagement with the parenting role, but increased sense of parenting efficacy in a small sample of mothers of children with autism compared with the normative data of Rogers and Matthews<sup>[17,18]</sup>.

The effect of the severity of a child's overall autism symptoms on parental wellbeing is however not clear. While some studies have found it to be a significant contributor to lower parental wellbeing<sup>[19,20]</sup>, other studies have found limited evidence for a link between parental wellbeing and symptom severity<sup>[21-23]</sup>. The one study examining the relationship between ASD severity and parenting sense of competency suggested that there is lower sense of satisfaction with the parenting role with increased symptom severity of ASD<sup>[15]</sup>. Some research has attributed the high level of psychological distress among parents of children with autism to the core traits of social communication deficits<sup>[10,24]</sup> and restrictive, repetitive behaviours<sup>[24-26]</sup> in their children. These hallmark deficits often make it difficult for parents to form secure, reciprocal relationships with their children<sup>[27,28]</sup>. Expressive communication difficulties may also contribute to the high levels of maladaptive, destructive and self-injurious behaviours found among children with autism<sup>[29-32]</sup>. The severity of a child's maladaptive behaviours, negative behaviours directed towards the self (termed internalising behaviours) and towards others (externalising behaviours), have also been found to be a significant contributor to the wellbeing of mothers of children with autism<sup>[33-36]</sup>. However, research has not yet been conducted into the impact of children's adaptive and maladaptive functioning on parental sense of competency<sup>[15]</sup>.

Recent analyses suggest that environmental factors, including socioeconomic status (SES) may have a greater impact on parent stress than child-related factors<sup>[37]</sup>. Key measures of SES include family measures including household income and parental level of education, and measures of community SES including community resources. The inadequate resources available to those from lower SES background have been proposed to exacerbate parenting stress and decrease wellbeing<sup>[38]</sup>. Additionally, internalising disorders such as depression and anxiety have been found to be directly associated with lower SES within the general population, findings which have been theorised to be a product of the everyday stressors associated with poverty<sup>[39]</sup>. Living in deprived neighbourhoods is also linked to poorer mental health independent of personal SES<sup>[40]</sup>. A number of studies have found evidence to suggest that having a child with autism or other disability is associated with reductions in household income, and thus lower SES<sup>[41,42]</sup>. However, the impact of SES on wellbeing in parents of children with autism is unclear. Among parents with children with autism, while higher family income has been associated with increased maternal wellbeing and self-reported quality of life<sup>[37,43,44]</sup>, greater levels of stress among parents of children with autism and other disabilities have been related to higher levels of education<sup>[45-47]</sup>. Conversely, other research suggests that higher levels of education but not income improve paternal quality of life in those with children with autism<sup>[48]</sup>. One study that examined the impact of income of parenting competence found that mothers with greater incomes had increased parenting satisfaction but had lower efficacy relative to mothers with lower incomes<sup>[15]</sup>. Families with low SES encounter a greater number of structural barriers which impair their capacity to meet their children's needs<sup>[49]</sup> which in turn may have an adverse impact on parental wellbeing.

With the potential relationship between symptoms of ASD and parental wellbeing, it is important to also consider how SES relates to ASD symptomatology and functioning in children with ASD. The little research that has been conducted suggests an increase in mood and behaviour problems among children with autism from low SES families<sup>[50,51]</sup>, and that living in impoverished neighbourhoods is associated with greater comorbid intellectual disability among children diagnosed

with autism<sup>[52,53]</sup>. Further, differential access to diagnostic services based on the SES may also contribute to delayed diagnosis within more deprived neighbourhoods, consequently delaying intervention and increasing the severity of a child's ASD symptoms<sup>[42,53-57]</sup>.

The literature relating to the relationship between SES and symptoms of ASD is complicated by the inclusion of a high proportion of participants living below the poverty line<sup>[48,58]</sup>, the use of author-generated measures of economic support<sup>[37]</sup> and the country in which the research was conducted with different patterns of findings emerging in countries with universal healthcare compared to American studies. The variation in the use of measurements of SES further complicates the conclusions that can be drawn. Further research is therefore required to understand the role of SES using validated measures in the Australian setting.

This study aimed to clarify the relationship between child related factors relating to ASD symptom severity and adaptive and maladaptive behaviours, and parental psychological wellbeing and whether this relationship is moderated by measures of SES. Additionally, we sought to explore whether there are differences between fathers and mothers in terms of these factors. We hypothesised that there would be significantly greater levels of symptoms of depression, anxiety and stress in parents of children with autism as compared to general population. We also hypothesised that there would be an association between greater autism symptom severity and maladaptive behaviours and lower parental psychological wellbeing and sense of parental competence and that this relationship would be moderated by measures of SES.

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## MATERIALS AND METHODS

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### **Participants**

Parents of children who started attending an Autism Specific Early Learning and Care Centre (ASELCC) in outer metropolitan Sydney, Australia between July 2010 and January 2015, were invited to participate in the study. The centre is one of six ASELCCs established by the Australian Government providing long day child care for children aged two to six years with a diagnosis of ASD. The centre is staffed by a multidisciplinary team including Child Care Workers, Early Childhood Teachers, Speech Pathologists, Occupational Therapists, and a Family Counsellor. Children enrolled in the program received individual and group-based early intervention using the Early Start Denver Model, an evidence-based intensive behavioural intervention for preschool children with ASD<sup>[59-61]</sup>.

All children received a diagnosis of autistic disorder or pervasive developmental disorder by a community-based physician using the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV), which are encompassed under the diagnosis of ASD under the DSM-5<sup>[1]</sup>. Exclusion criteria included conditions with a known genetic aetiology (*e.g.*, Fragile X Syndrome) or neurological (*e.g.*, epilepsy) disorders, and significant vision, hearing, motor or physical problems. Additional criteria for entry to the Centre included the ability to meet fee payment through personal and funding bodies including government funding, and for children to be able to physically attend the Centre.

### **Procedure and measures**

This study was approved by the local institutional Human Research Ethics Committee. After providing informed consent to participate at the time of their child's enrolment in the ASELCC, parents completed a demographic questionnaire as well as standardised questionnaires assessing parental psychological wellbeing and the severity of their child's autism symptoms. An objective assessment of the child's severity of symptoms of autism was also undertaken by researchers at the Centre. All assessment tools used in this study have strong psychometric properties.

### **Parental wellbeing**

Parental wellbeing was assessed using the Parenting Sense of Competence Scale (PSOC)<sup>[62]</sup> and the Depression Anxiety Stress Scales (DASS)<sup>[63]</sup>.

The PSOC includes 17 items designed to measure parental self-efficacy, and generates scores on three subscales: Satisfaction, Interest and Efficacy. The PSOC was scored such that higher scores indicated higher levels of self-perceived competency. This involved reverse scoring the Efficacy subscale, on which higher scores indicate lower levels of efficacy. The PSOC has strong psychometric properties including satisfactory internal consistency, test-retest reliability, convergent validity with measures of child behaviour and high levels of temporal stability<sup>[17]</sup>.

The DASS is a 21-item self-report measure that assesses negative affect, generating separate scores for the subscales of Depression, Anxiety and Stress. Higher scores indicate greater symptomatology. The DASS-21 has excellent psychometric properties with high levels of internal consistency across the Depression, Anxiety and Stress subscales as well as high levels of temporal validity, higher levels of convergent validity than other anxiety and depression scales<sup>[63-65]</sup>.

### **Autism severity**

The severity of the child's autism symptoms was measured using the Social Communication Questionnaire (SCQ)<sup>[66]</sup> and the Autism Diagnostic Observation Schedule (ADOS)<sup>[67]</sup> or the ADOS second edition<sup>[68]</sup>.

The SCQ is a 40-item, parent-report measure of autism-specific symptoms, with higher scores indicating increased autism severity. The SCQ produces a total score, with a score of 15 or greater considered being indicative of autism. The SCQ has three subscales assessing problems in the domain of communication (SCQ Communication subscale), problems in reciprocal social interaction (SCQ Social subscale) and the presence of restricted, repetitive and stereotyped behaviours (SCQ RRSB subscale). A greater score on each subscale indicates a greater level of difficulty. The SCQ has robust psychometric properties including levels of interenal consistency, test-retest reliability and good discriminative validity between preschoolers with autism and non-clinical samples<sup>[69-71]</sup>.

The ADOS and ADOS-2 are semi-structured, standardised play-based assessments to examine key symptoms of autism including communication, social interaction, play and creativity, and other behaviours including restricted and repetitive behaviours<sup>[67,68]</sup>. The assessment was conducted by researchers trained in the administration and scoring of the ADOS. The ADOS has a cutoff score above which autism is considered and it also provides scores indicating the likely level of severity of autism spectrum symptoms. The ADOS and ADOS-2 have sound psychometric properties, including high levels of internal consistency, interrater reliability, test-retest reliability and diagnostic predictive validity<sup>[67,68]</sup>.

Children's adaptive functioning was assessed using the Vineland Adaptive Behaviour Scales, Second Edition (VABS-II)<sup>[72]</sup>. The VABS-II assesses parents' perceptions of their child's everyday adaptive functioning across broad domains including communication, daily living skills, socialisation and motor skills. A norm-referenced standardised Adaptive Behaviour Composite is calculated, with higher scores indicating greater levels of adaptive functioning. The maladaptive behaviour domain assesses problem behaviours, with higher scores indicating greater difficulties. The VABS-II has well-established strong psychometric properties in the preschool age group, including high levels of internal consistency, test-retest reliability, interrater reliability and has been found to be a valid measure of the severity of autism symptomology<sup>[72]</sup>.

### **Socio-economic status**

SES is used in this paper to describe the position of a person within a hierarchical social structure<sup>[73]</sup>. Two mechanisms were used to assess SES; the first was based on parents' occupation and education levels using the Australian Socioeconomic Index of occupational status (AUSEI06)<sup>[74]</sup>. The AUSEI06 is a socio-economic index developed in response to the introduction of the Australian and New Zealand Standard Classification of Occupations (ANZSCO) by the Australian Bureau of Statistics<sup>[75]</sup>. The AUSEI06 is used to convert ANZSCO codes into occupational status scores ranging from 0 to 100, with higher scores indicative of higher SES. Where both parents are employed, the AUSEI06 is calculated by taking the score of the parent with the highest occupational status. When an individual is not in paid employment, the score is assigned using his or her educational level. Where two parents indicated employment - the highest AUSEI06 code was used; where one parent indicated employment, their AUSEI06 code was used; where neither parent was employed, the highest imputed AUSEI06 code was used. The AUSEI06 is based on the International Socioeconomic Index<sup>[76]</sup> in which occupation is described as the "engine" that converts education into income. The AUSEI06 possesses adequate psychometric properties<sup>[75]</sup>.

The second mechanism of assessing SES was the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) from the Socio-economic Indexes for Areas (SEIFA) 2016 based on the 2016 Census of Population and Housing<sup>[77,78]</sup>. The definition of relative advantage and disadvantage refers to "people's access to material and social resources, and their ability to participate in society"<sup>[79]</sup>, with the IRSAD providing a summary measure<sup>[77,78]</sup>. Percentile ranking of postcodes from across Australia can be used to ascertain the SEIFA score. Lower scores indicate relatively greater disadvantage and general lack of advantage, while higher scores indicate generally greater advantage and a relative lack of disadvantage<sup>[78]</sup>.



### Statistical analysis

Statistical analyses were conducted using SPSS version 25.0. *T*-tests were used to compare participants' scores on the PSOC and DASS to Australian normative data presented by Rogers and Matthews<sup>[17]</sup> for the PSOC and Crawford *et al*<sup>[78]</sup> for the DASS. Pearson's *r* correlations were conducted to examine relationships between SES, parental wellbeing and severity of autism symptoms, with hierarchical multiple regression then used to explore possible moderating effects of SES. Correlations were considered as statistically significant for  $P \leq 0.01$  to partially control for multiple comparisons, however relationships to  $P \leq 0.03$  are reported to examine trends. Cohen's categorisation of correlation coefficients was used in this study with  $\geq 0.1$  denoting a small effect size,  $\geq 0.3$  a medium effect size and  $\geq 0.5$  a large effect size<sup>[80]</sup>.

## RESULTS

Of the 165 children enrolled at the Centre in the study period, data for at least one parent for the PSOC and/or the DASS and at least one measure of socio-economic background was available for 117 children. For the PSOC, data was available for 107 mothers and 54 fathers; for the DASS, data was available for all subscales for 101 mothers and 53 fathers. Demographic information is presented in Table 1. The majority of children were male, with a mean age of 4.1 years at the time of enrolment. More than half were from a culturally and linguistically diverse (CALD) background, and close to half had English as an additional language spoken at home. The most common languages spoken at home were Vietnamese ( $n = 20$ , 18% of sample) and Arabic ( $n = 11$ , 9.9% of sample). Mothers were the predominant primary carer. In terms of SES, the majority of families lived in postcode areas in the bottom and middle thirds of IRSAD. However, when considering the AUSEI06 rankings, the majority of the sample fell in the top third.

Means and standard deviations for measures of ASD symptom severity are reported in Table 2. Means and standard deviations for measures of PSOC and DASS are presented in Table 3, with Table 4 providing results comparing our data with the Australian normative data presented by Rogers and Matthews<sup>[17]</sup> for the PSOC and Crawford *et al*<sup>[78]</sup> for the DASS.

There were no statistically significant differences on any of the three subscales of the PSOC between mothers and fathers in our sample. When compared with the Australian normative data presented by Rogers and Matthews<sup>[17]</sup>, mothers in our sample had significantly higher levels of parenting sense of efficacy, but lower levels of interest in the parenting role and comparable levels of satisfaction. For fathers in our sample, there were no differences in levels of parenting satisfaction compared with the normative data. However, they had significantly higher levels of parenting efficacy and lower levels of interest in the parenting role than the normative data.

There were also no statistically significant differences in levels of symptoms of depression, anxiety or stress as measured by the DASS between mothers and fathers in our sample. However, mothers in our sample had significantly greater levels of symptoms of depression, anxiety and stress than the Australian normative data presented by Crawford *et al*<sup>[78]</sup>. Fathers in our sample on the also had significantly greater levels of symptoms of depression than the normative data. However, there were no differences in the levels of symptoms of anxiety or stress between fathers in our sample compared with normative data.

There were no statistically significant differences between scores of parental wellbeing and levels of symptoms of depression, anxiety or stress as measured by the DASS among CALD and non-CALD mothers and fathers. There was also no statistically significant difference in the levels of parenting satisfaction as measured by the PSOC between CALD and non-CALD mothers and fathers.

There were no statistically significant correlations between measures of SES and measures of ASD symptom severity. There was a small but significant positive correlation between SES, measured through the IRSAD and mothers' interest in parenting scores (Table 5). No other correlations between measures of SES and parenting sense of competence or wellbeing met significance.

There were small but significant negative correlations between children's communication skills and mother's parenting satisfaction and small to moderate negative correlations between mothers' sense of parenting efficacy and children's communication skills and restrictive, repetitive and stereotyped behaviours (Table 5). There was also a trend towards a small negative correlation between children's social interaction skills and maternal parenting satisfaction, and a trend towards a small positive correlation between children's adaptive functioning and maternal satisfaction.

**Table 1 Demographic information**

Demographic information	n (%)
Sex of child (male: female, <i>n</i> = 117)	96 (82.1): 21 (17.9)
Age of child in years at enrolment at Centre ( <i>n</i> = 117)	
mean (SD)	4.13 (0.53)
Median (range)	4.15 (2.74-5.79)
Country of birth of child (Australia: overseas, <i>n</i> = 110)	106 (96.4): 4 (3.6)
Indigenous background ( <i>n</i> = 88)	4 (4.5)
CALD background ( <i>n</i> = 107)	63 (58.9)
English as additional language ( <i>n</i> = 111)	49 (44.1)
Primary carer ( <i>n</i> = 75)	
Mother	68 (90.7)
Father	5 (6.7)
Other extended family	2 (2.7)
IRSAD percentile ranking ( <i>n</i> = 116)	
mean (SD)	38.8 (25.06)
Median (range)	34 (4-95)
IRSAD categories ( <i>n</i> = 111)	
Lowest third	43 (38.7)
Middle third	49 (44.1)
Top third	19 (17.1)
AUSEI06 percentile ranking ( <i>n</i> = 112)	
mean (SD)	65.56 (20.56)
Median (range)	71.6 (7.9-100)
AUSEI06 ( <i>n</i> = 109)	
Lowest third	7 (6.4)
Middle third	33 (30.3)
Top third	69 (63.3)

CALD: Culturally and linguistically diverse; IRSAD: Index of Relative Socio-economic Advantage and Disadvantage; AUSEI06: Australian Socioeconomic Index 2006.

No correlations between fathers' parenting sense of competence and severity of children's ASD symptoms met significance. There were also no significant correlations between mothers' or fathers' sense of wellbeing as measured through the DASS and severity of ASD symptoms.

There were significant correlations between mothers' DASS and PSOC scores, fathers' DASS and PSOC scores and the PSOC and DASS scores of mothers and fathers (results not reported; contact authors for results) (Table 6).

When correlations were conducted splitting the groups into three levels of SES (low - 0-33.3 percentiles, medium - 33.4-66.6 percentiles and high - 66.7 to 100 percentiles for the AUSEI06 and IRSAD separately), there were significant correlations between parenting sense of competence and wellbeing for different levels of SES, particularly for those in the higher SES brackets (Table 5). No results are presented for fathers in the middle SES tertile when using the AUSEI06 as the sample size was less than 10. It is noteworthy that there were no significant correlations for mothers or fathers between symptoms of stress measured through the DASS against child's ASD symptom severity when the sample was split into the three SES groupings.

Moderation analyses revealed no significant interaction between SES (AUSEI06 or IRSAD) and ASD symptom severity as measured by VABS adaptive and maladaptive functioning scores, SCQ scores or ADOS comparison scores for any parent measures of parenting sense of competence or wellbeing.

## DISCUSSION

This study sought to assess the extent to which SES moderates the impact of child-specific factors on the psychological wellbeing and sense of parenting competency in mothers and fathers of preschoolers with autism. We found that, while there was no

**Table 2 Means and standard deviations for measures of autism spectrum disorder symptom severity**

ASD symptom severity measure	mean (SD, range)
SCQ communication ( <i>n</i> = 109)	5.66 (2.09, 0-12)
SCQ social ( <i>n</i> = 110)	7.19 (3.47, 0-14)
SCQ RRSB ( <i>n</i> = 110)	4.36 (2.32, 0-8)
SCQ total ( <i>n</i> = 110)	18.36 (6.29, 2-36)
VABS adaptive ( <i>n</i> = 99)	64.56 (12.48, 42-106)
VABS maladaptive ( <i>n</i> = 106)	19.26 (1.87, 15-24)
ADOS severity score ( <i>n</i> = 99)	7.11 (1.76, 1-10)

SCQ: Social Communication Questionnaire; RRSB: Restricted, repetitive and stereotyped patterns of behaviour; VABS: Vineland Adaptive Behavior Scales; ADOS: Autism Diagnostic Observation Schedule; ASD: Autism spectrum disorder.

effect of SES on levels of parental wellbeing or parenting competence and efficacy overall, distinct factors impacted the wellbeing of mothers and fathers.

While there has been significant research examining the wellbeing of parents of children with autism, the majority of this research has been primarily focused on the experiences of mothers<sup>[80]</sup>. While there was no statistically significant relationship between SES and paternal wellbeing or competence across our whole sample, there was a moderate trend towards lower levels of family SES being associated with increased levels of stress and anxiety among fathers. This trend is broadly consistent with previous qualitative research that has highlighted fathers of children with autism often take up the role of “breadwinner”<sup>[81]</sup>, consequently lower personal SES may have a greater impact on fathers. Our finding of a trend in this direction rather than a significant finding may reflect the limited sensitivity of the AUSEI06, which estimates SES based on parental occupation or education levels, as an accurate estimate of personal SES. Our findings do however contrast the results of much of the existing literature which has not found an influence of SES on parental wellbeing<sup>[25,82,83]</sup> or has found that higher personal SES was associated with increased wellbeing among mothers but not fathers<sup>[58]</sup>. These different findings may be due to differences in the conceptualisation of SES and the homogeneous demographic characteristics of the previous studies. These studies used measures such as household income<sup>[58]</sup> or composite estimates of SES that incorporated personal disadvantage, occupational status and income<sup>[25]</sup> or educational status and overall income<sup>[82]</sup>. The disparity in these findings suggest that further research is needed with more sensitive tools and more specific categorisations of SES to better understand the impact of SES on fathers and mothers of preschoolers with autism.

Importantly, our study revealed further differences in the effect of child-specific factors on the parenting competence and wellbeing of mothers and fathers was affected by both gender and SES. In this regard, parent reports of child ASD symptom severity and adaptive functioning were associated with lower satisfaction and efficacy among mothers but not among fathers. When the relationship between SES and parental efficacy and satisfaction was examined separately across the three SES brackets, this relationship was only found among mothers in the highest family and highest and middle community SES brackets. Among fathers in the highest family SES bracket from advantaged backgrounds, greater levels of maladaptive behaviour and greater symptom severity in children were associated with a lower sense of parenting efficacy.

The finding that low paternal parenting efficacy is associated with greater child maladaptive behaviours is consistent with the findings of earlier studies that have found a similar relationship among fathers of typically developing children<sup>[63,83]</sup>. However, it is unclear why our finding was specific to fathers from higher SES brackets only. One possible explanation is that parents with a higher SES have higher expectations of their children compared to parents with a lower status<sup>[84]</sup>. Alternatively, parents in higher SES brackets who are working may have less time to spend with their children and address their behavioural needs. This novel finding warrants replication with a larger sample of fathers to clarify whether differences exist between the effect of community SES and personal SES on paternal wellbeing and to explore the underpinnings of such a differential relationship.

There was also a trend towards maternal depression and lower levels of adaptive skills that was found to be significant among mothers from the highest community

**Table 3 Means and standard deviations for mothers' and fathers' parenting sense of competence and symptoms of depression, anxiety and stress**

	Mothers, mean (SD, range)	Fathers, mean (SD, range)
PSOC satisfaction	3.67 (1.04, 1-6), <i>n</i> = 107	3.74 (0.91, 2.17-5.67), <i>n</i> = 54
PSOC efficacy	4.34 (0.89, 1.43-6), <i>n</i> = 107	4.31 (0.67, 2.71-5.71), <i>n</i> = 54
PSOC interest	4.88 (1.12, 1-6), <i>n</i> = 107	4.66 (1.00, 2.50-6), <i>n</i> = 54
DASS depression	3.57 (3.68, 0-13), <i>n</i> = 102	3.78 (4.32, 0-16), <i>n</i> = 54
DASS anxiety	2.76 (3.03, 0-11), <i>n</i> = 101	2.45 (3.01, 0-13), <i>n</i> = 53
DASS stress	5.32 (3.92, 0-15), <i>n</i> = 101	5.04 (4.42, 0-15), <i>n</i> = 53

PSOC: Parenting Sense of Competence; DASS: Depression Anxiety Stress Scale.

SES bracket. However other relationships emerged between child-related factors and paternal wellbeing. Overall our results suggest that symptom severity may have a greater impact on the wellbeing, efficacy and competence of higher SES parents and contradicts the findings of earlier studies that symptom severity and adaptive functioning affects maternal distress but not paternal distress<sup>[20-22]</sup>. Notably the experiences of parents of children with autism from different SES brackets have not been examined separately as such these findings contribute to a more nuanced understanding of the influence of SES on parental wellbeing and efficacy. Further investigation is however needed to untangle the differential effects between fathers versus mothers and those from high versus low SES (personal SES) and those from deprived versus advantaged backgrounds (community SES).

Interestingly the differences between mothers and fathers in parenting competence and wellbeing in our sample emerged only in the analysis of parental reports of their child's ASD symptom severity using SCQ but no differences emerged in the analysis of severity as measured by the gold standard ADOS assessments. As a parent report measure, the SCQ score may better reflect parental awareness and perception of symptoms and their severity as opposed to the objective measure of the ADOS.

Consistent with our hypothesis, we found significantly greater levels of symptoms of depression, anxiety and stress among mothers of children with autism compared to the normative Australian data, and higher levels of symptoms of depression in fathers. Our findings of elevated symptoms of depression, anxiety and stress levels in mothers with children with ASD is consistent with previous research<sup>[4,10,85,86]</sup>. We also found that fathers experienced significantly more symptoms of depression but comparable levels of anxiety and stress levels to the normative sample. This is also in keeping with the existing data where mothers have been found to have lower wellbeing scores and higher stress scores compared to fathers of children with autism<sup>[37,87-89]</sup>. It is possible that the primary responsibility for caring for a child with autism has traditionally rested with mothers and the adverse psychological impact observed in mothers may be a function of this primary carer responsibility rather than the gender of the parent<sup>[21]</sup>. While in our sample the primary caregiver role was also predominantly served by the mothers, the intervention program delivered through the Centre encourages the involvement of both parents. This in turn may have resulted in fathers in our sample also being closely involved in parenting and early intervention services and therefore experiencing similar levels of depression, anxiety and stress as the mothers. While previous studies found that the depressive symptoms reported by fathers of children with autism were comparable to those reported by fathers of typically developing children<sup>[88]</sup>, these studies have included parents of school aged children and adolescents who may have different parenting demands. Our study suggests that both mothers and fathers of preschoolers with autism may be at risk of heightened psychological distress.

Both mothers and fathers in our sample displayed greater parental efficacy but lower interest in the parenting role compared with normative samples<sup>[17]</sup>, with mothers also displaying greater satisfaction with their parenting. This extends the findings of previous research carried out at the same early intervention centre<sup>[18]</sup> in a larger sample and provides information on not only mothers but also fathers. While other studies have found lower parenting efficacy among mothers of children with autism<sup>[12,90]</sup>, our finding of increased parental self-efficacy may be due to the parental involvement and participation in the early intervention program for ASD that is provided at the Centre where the study was conducted. Similar finding of better parenting efficacy has been found following behavioural interventions for ADHD<sup>[91,92]</sup>. Further research using community-based recruitment methods are necessary to understand the nature and interaction of the relationship between parenting

**Table 4 Comparison of our data with normative data**

	Mothers	Fathers
PSOC satisfaction <sup>1</sup>	t(864) = 2.160, <i>P</i> = 0.031 <sup>a</sup>	t(351) = -1.572, <i>P</i> = 0.117
PSOC efficacy <sup>1</sup>	t(864) = 13.065, <i>P</i> < 0.001 <sup>d</sup>	t(351) = 3.788, <i>P</i> < 0.001 <sup>d</sup>
PSOC interest <sup>1</sup>	t(125.573) = -2.036, <i>P</i> = 0.044 <sup>a</sup>	t(61.599) = -2.972, <i>P</i> = 0.004 <sup>b</sup>
DASS depression <sup>2</sup>	t(597) = 2.399, <i>P</i> = 0.017 <sup>a</sup>	t(549) = 2.158, <i>P</i> = 0.031 <sup>a</sup>
DASS anxiety <sup>2</sup>	t(596) = 3.318, <i>P</i> = 0.001 <sup>b</sup>	t(548) = 1.760, <i>P</i> = 0.079
DASS stress <sup>2</sup>	t(596) = 2.090, <i>P</i> = 0.004 <sup>b</sup>	t(548) = 1.703, <i>P</i> = 0.089

<sup>a</sup>*P* < 0.05.<sup>b</sup>*P* < 0.01.<sup>d</sup>*P* < 0.001.<sup>1</sup>Compared with normative data presented in Rogers and Matthews<sup>[17]</sup>.<sup>2</sup>Compared with normative data presented in Crawford *et al*<sup>[78]</sup>.

PSOC: Parenting Sense of Competence; DASS: Depression Anxiety Stress Scale.

preschoolers with autism and parenting efficacy vis-a-vis participation in early intervention programs. The limited associations between child ASD symptom severity, child adaptive and maladaptive behaviours and SES on parental wellbeing and parenting sense of competence suggests that other factors may play an important role. The large relationship between scores on the Parenting Sense of Competency and Depression, Anxiety and Stress Scale in supplementary analyses suggests an interrelationship between these facets, consistent with the previous literature<sup>[12,15,16]</sup>, however the directionality of this relationship needs further exploration. Further, the large relationship between mothers' and fathers' wellbeing and sense of competency suggests the interdependence of parenting competence and wellbeing within a family. These relationships also provide insight into the lack of differences in wellbeing and parenting competence between mothers and fathers. Our finding of no relationship between SES and ASD symptomology is contrary to our hypothesis and deserves further exploration. Given the suggestion that autism in the absence of intellectual disability may be diagnosed later among lower SES families<sup>[53,91-93]</sup>, and the low numbers of families from the lowest AUSEI06 categories who participated in this study, it is possible that our study may not have fully captured the impact of SES on ASD severity.

The current study has the advantage of exploring both maternal and paternal wellbeing and sense of competence in parents of preschoolers with autism whereas much of the previous literature has not included fathers of children with autism. Additionally this study had a high proportion of children from CALD backgrounds and it is of interest that there were no significant differences between the wellbeing and competence of parents from CALD and non CALD backgrounds in our study. However, our study examines this only in those attending an Autism Specific Early Learning and Care Centre (ASELCC) in one specific location in Australia. Whether these findings extend to parents of preschoolers attending other ASELCCs throughout Australia, attending other childcare or preschool settings or not attending any out of home day care needs to be verified through further research.

Our study also had a limited number of families in the lowest family SES category based on AUSEI06, with a particularly restricted limited number of fathers in the lower SES categories. Since it has been suggested that lower SES families may experience delays in diagnosis due to differential access to diagnostic services<sup>[53,91-93]</sup>, it is possible that lower SES families have not had the benefit of early identification and enrolment to early intervention such as the centre from where this study was conducted. Alternatively, it is possible that lower income families were less likely to participate in research due to time constraints.

As with much of the existing literature, the recruitment from a centre which provides specialised services for children with ASD may have resulted in sampling bias, as the parents of these children are already showing parenting interest and efficacy by virtue of the fact that they have sought early intervention support. It is possible that the relationship between the factors we assessed may differ among families with limited access to early intervention, health or social services programs. Future studies which recruit from the community settings may overcome these limitations.

Another potential reason for the limited number of parents categorised to be in the low family SES group in this study may be due to inflation of AUSEI06 scores for families with no parent reported to be working. In such circumstances, the AUSEI06

**Table 5 Means and standard deviations for culturally and linguistically diverse and non-culturally and linguistically diverse parents' parenting sense of competence and symptoms of depression, anxiety and stress**

	CALD, mean (SD, range)	Non-CALD, mean (SD, range)
<b>Mothers</b>		
PSOC satisfaction	3.65 (1.06, 1.2-5.6), <i>n</i> = 57	3.78 (0.98, 2-6), <i>n</i> = 41
PSOC efficacy	4.32 (0.84, 1.86-6), <i>n</i> = 57	4.34 (0.99, 1.43-5.71), <i>n</i> = 41
PSOC interest	4.76 (1.3, 1-6), <i>n</i> = 57	5.01 (0.90, 3-6), <i>n</i> = 41
DASS depression	3.39 (3.56, 0-13), <i>n</i> = 51	3.49 (3.77, 0-13), <i>n</i> = 41
DASS anxiety	2.66 (2.97, 0-9), <i>n</i> = 50	2.63 (2.99, 0-11), <i>n</i> = 41
DASS stress	5.60 (3.57, 0-13), <i>n</i> = 50	4.61 (4.41, 0-15), <i>n</i> = 41
<b>Fathers</b>		
PSOC satisfaction	3.90 (0.93, 2.17-5.67), <i>n</i> = 29	3.55 (0.78, 2.33-5), <i>n</i> = 20
PSOC efficacy	4.35 (0.93, 3-5.71), <i>n</i> = 29	4.26 (0.80, 2.71-5.57), <i>n</i> = 20
PSOC interest	4.52 (0.95, 2.5-6), <i>n</i> = 29	4.85 (1.05, 2.5-6), <i>n</i> = 20
DASS depression	2.70 (3.68, 0-15), <i>n</i> = 30	5.10 (4.99, 0-16), <i>n</i> = 20
DASS anxiety	2.45 (2.71, 0-11), <i>n</i> = 29	2.35 (3.51, 0-13), <i>n</i> = 20
DASS stress	4.24 (3.77, 0-15), <i>n</i> = 29	5.85 (5.07, 0-15), <i>n</i> = 20

CALD: Culturally and linguistically diverse; PSOC: Parenting Sense of Competence; DASS: Depression Anxiety Stress Scale.

score is based on education level, however the current study did not differentiate between TAFE or other vocational educational or post-secondary education and university bachelor level qualifications. Thus, all who indicated tertiary level education received the same higher AUSEI06 score. This use of educational level to impute SES may be particularly problematic in the case of parents of children with autism and other developmental disabilities as previous studies have found that although parents tend to have higher education levels, due to the significant challenges in caring for their children, they may be unemployed or underemployed and may have lower than expected income compared to their full educational potential<sup>[42,58,94-98]</sup>. Further, the AUSEI06's failure to consider the extent to which a parent participates in the workforce, whether full time or part time, could have also inflated parental SES. The majority of studies examining SES have failed to include personal and environmental measures of SES and the inclusion of a measure of community SES is a significant strength of our study. Further exploration of the relationship between ASD symptom severity and parental wellbeing and sense of parenting competency using alternative measures of SES such as household income is therefore required.

Our study suggests that SES differentially impacts wellbeing and sense of parenting competence and its relationship to the impact of child symptoms for mothers and fathers of preschoolers with autism. Such differences between mothers and fathers need to be further understood to inform targeted parental intervention. Given the integral role of parents in ensuring the success of early intervention programs<sup>[13]</sup>, it is essential that these interventions address the determinants of parental wellbeing as well as child-specific outcomes.

**Table 6 Significant correlations between measures of parenting sense of competence and wellbeing and autism spectrum disorder symptom severity for the whole sample and by levels of socioeconomic status**

Mothers			Fathers		
Full sample	Sample by AUSEI06	Sample by IRSAD	Full sample	Sample by AUSEI06	Sample by IRSAD
<b>PSOC satisfaction</b>					
Negative: SCQ communication, r(99) = -0.270, P = 0.007	<b>Top third of SES:</b> Negative: SCQ total, r(60) = -0.317, P = 0.013	<b>Middle third of SES:</b> Negative: SCQ communication, r(39) = -0.457, P = 0.003			
Negative: SCQ total, r(100) = -0.264, P = 0.008	Negative: SCQ communication, r(59) = -0.300, P = 0.021	<b>Top third of SES:</b> Negative: SCQ communication, r(17) = -0.545, P = 0.024			
Negative: SCQ social, r(100) = -0.226, P = 0.024		Negative: SCQ RRBI, r(17) = -0.553, P = 0.021			
Positive: VABS - adaptive, r(90) = 0.235, P = 0.026		Negative: SCQ total, r(17) = -0.572, P = 0.016			
<b>PSOC efficacy</b>					
Negative: SCQ social, r(100) = -0.291, P = 0.003	<b>Top third of SES:</b> Positive: VABS - adaptive, r(56) = 0.360, P = 0.006	<b>Top third of SES:</b> Negative: SCQ communication, r(17) = -0.719, P = 0.001		<b>Top third of SES:</b> Negative: VABS - maladaptive, r(37) = -0.461, P = 0.004	<b>Bottom third of SES:</b> Negative: VABS - maladaptive, r(23) = -0.487, P = 0.018
Negative: SCQ RRSB, r(100) = -0.307, P = 0.002	Negative: SCQ total, r(60) = -0.374, P = 0.003	Negative: SCQ social, r(17) = -0.609, P = 0.010		Negative: SCQ total, r(39) = -0.449, P = 0.004	
Negative: SCQ total, r(100) = -0.348, P < 0.001	Negative: SCQ Social, r(60) = -0.304, P = 0.018	Negative: SCQ Total, r(17) = -0.660, P = 0.004			
Positive: VABS - adaptive, r(90) = 0.230, P = 0.029	Negative: SCQ RRBI, r(60) = -0.312, P = 0.015				
<b>PSOC interest</b>					
Positive: IRSAD, r(106) = 0.278, P = 0.004		<b>Middle third of SES:</b> Negative: SCQ communication, r(39) = -0.364, P = 0.023			
		<b>Top third of SES:</b> Negative: SCQ communication, r(17) = -0.553, P = 0.021			
<b>DASS depression</b>					
Negative: VABS - adaptive, r(85) = -0.258, P = 0.017		<b>Top third of SES:</b> Negative: VABS - adaptive, r(14) = -0.664, P = 0.010	Negative: AUSEI06, r(52) = -0.323, P = 0.020		
Positive: SCQ total, r(95) = 0.238, P = 0.020					
<b>DASS anxiety</b>					
		<b>Top third of SES:</b> Positive: VABS - maladaptive, r(14) = 0.644, P = 0.013	Negative: AUSEI06, r(52) = -0.316, P = 0.023		
<b>DASS stress</b>					
		<b>Top third of SES:</b> Positive: ADOS comparison (severity) score, r(14) = 0.635, P = 0.015	Negative: AUSEI06, r(53) = -0.305, P = 0.026		

The value in parenthesis after “r” is the sample size for the analysis (n). PSOC: Parenting Sense of Competence; DASS: Depression Anxiety Stress Scale; SCQ: Social Communication Questionnaire; VABS: Vineland Adaptive Behavior Scales; IRSAD: Index of Relative Socio-economic Advantage and Disadvantage; AUSEI06: Australian Socioeconomic Index 2006; SES: Socioeconomic status.

## ARTICLE HIGHLIGHTS

### **Research background**

There is converging evidence that higher levels of stress and psychological distress is experienced by parents of children with autism compared to typically developing children.

### **Research motivation**

There is limited research on the role of socioeconomic status (SES) on the wellbeing of parents of preschool children with autism and its impact if any on parental competency and children's autism symptom severity

### **Research objectives**

The primary objective of this study was to examine the relationship between symptom severity, SES and psychological wellbeing among parents of preschoolers with autism. The findings will have implications for future planning of services to support the parents and also for future research on family and psychosocial predictors of treatment response.

### **Research methods**

The study assessed parents (mothers and fathers) of preschool-aged children with autism on their own perceptions of parental competence and wellbeing using questionnaires and children were assessed using objective standardised measures of autism severity, cognitive level and parent reports of adaptive functioning.

### **Research results**

A differential impact was observed for mothers and fathers as to the impact of SES and their child's symptom severity on their parenting competence and sense of wellbeing.

### **Research conclusions**

The findings from this study suggest that SES differentially impacts the wellbeing and sense of parenting competence in fathers and mothers of preschool children with autism. While both mothers and fathers displayed higher levels of depression than normative populations, mothers also reported greater levels of stress and anxiety. Child symptom severity was associated with maternal parenting competency, and this was exaggerated among mothers with higher familial SES and who lived in areas of greater neighbourhood advantage. However, paternal parenting competence was generally not influenced by child adaptive functioning or symptom severity, albeit for those from higher familial SES background, there was an inverse relationship between children's symptom severity and maladaptive symptoms and paternal sense of parenting efficacy. This has implications for service provision as it highlights the need for comprehensive assessment of the support needs for both fathers and mothers independently.

### **Research perspectives**

Since this study was done in a specialised early intervention centre, the findings may have been influenced by sampling bias in terms of access to such services. In this regard, families in the lowest SES category were underrepresented and this was particularly the case for father participation in this research project. It is possible that lower SES families may not have had the benefit of early identification and enrolment to early intervention centres such as the one where this project was undertaken. This may have been compounded by the fact that fathers from lower SES background may have less time availability and capacity to participate in research. Future studies would benefit from targeted recruitment of those sections of the autism community who are currently not engaging with routine health services and are also underrepresented in research.

## ACKNOWLEDGEMENTS

This research was conducted as part of the Child and Family Outcomes Study at the KU Marcia Burgess Autism Specific Early Learning and Care Centre, funded by the Australian Government with the University of New South Wales as a research partner. The authors would like to thank the staff and families who participated in the project and, in particular, Kate Piromalli, Nicole Lees and Feroza Khan for their assistance with data collection and Elizabeth Aylward for her support to the research project.

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