Abstract

This study aimed to examine the influence of differences in household status on the parental stress, coping, time use and quality of life (QoL) among mothers of children with autism spectrum disorders. Forty-three single and 164 coupled mothers completed the survey. Data were analysed using multivariate logistic regression. We found that single mothers were 1.05 times more likely to report lower levels of environmental QoL. Whilst they were 1.73 times more likely to use acceptance coping style, this association did not persist after adjusting for total number of children, household income and employment status. There was no difference in time use and stress between these mothers. Possible environmental issues for single mothers and implications for future research are discussed.

Keywords

ASD, single and coupled mothers, time use, quality of life, stress, coping

Title: Quality of life, coping styles, stress levels, and time use in mothers of children with autism spectrum disorders: comparing single versus coupled households

Parenting a child with autism spectrum disorders (ASD) can be a challenging task (Nicholas et al., 2016). It is well documented that parents of children with ASD experience higher levels of stress than parents of children without ASD (Griffith, Hastings, Nash, & Hill, 2010; Montes & Halterman, 2007; Zablotsky, Bradshaw, & Stuart, 2013). Limited social skills, challenging behaviour of the child with ASD (Bromley, Hare, Davison, & Emerson, 2004; Griffith et al., 2010) and low levels of family support (Bromley et al., 2004) are some of the factors associated with the increased parental stress levels.

Previous studies with families of children with ASD have developed knowledge on the parental experiences, such as parental stress levels (Griffith et al., 2010), coping styles (Marshall & Long, 2010), time use (Sawyer et al., 2010), and quality of life (QoL) (Dardas & Ahmad, 2014a). In the study of the parental experiences, the experiences of mothers of children with ASD are commonly examined (Ekas, Lickenbrock, & Whitman, 2010; Ekas & Whitman, 2010; Kuhaneck, Burroughs, Wright, Lemanczyk, & Darragh, 2010; Marshall & Long, 2010; Seymour, Wood, Giallo, & Jellett, 2013). Mothers face an increased risk of ill health (Allik, Larsson, & Smedje, 2006), and are required to assume multiple roles to cater for the unique demands of the child with ASD (Safe, Joosten, & Molineux, 2012). Studies that specifically examined the experiences of fathers are somewhat limited (Burrell, Ives, & Unwin, 2017; Cheuk & Lashewicz, 2016); however, some studies have compared the experiences between mothers and fathers of children with ASD (Allik et al., 2006; McStay, Trembath, & Dissanayake, 2014; Mugno, Ruta, D'Arrigo, & Mazzone, 2007). For example, there is emerging evidence to suggest mothers of children with ASD experience lower levels of QoL than fathers (McStay et al., 2014).

Previous studies have used various parental characteristics in investigating the experiences of parents of children with ASD. These characteristics include age (Gray, 2006; Pruitt, Willis, Timmons, & Ekas, 2016), gender (Allik et al., 2006; Lee, 2009; McStay et al., 2014; Mugno et al., 2007), employment status (Dardas & Ahmad, 2014a), and household income (Dardas & Ahmad, 2014a). In fact, a recent review on coping styles among parents of children with ASD reported that age and gender of parents are the most commonly discussed factors (Lai & Oei, 2014). Spousal relationship factors, such as spousal support (Dunn, Burbine, Bowers, & Tantleff-Dunn, 2001), marital satisfaction (Higgins, Bailey, & Pearce, 2005), and marital quality (Harper, Dyches, Harper, Roper, & South, 2013), are other parental characteristics used to investigate the experiences of parents of children with ASD. Parents of children with ASD were found to experience spousal relationship issues when they used maladaptive coping strategies, such as escape-avoidance (Dunn et al., 2001).

Few studies have compared the experiences of parents of children with ASD using a parental characteristic of single versus coupled household status. Household status is common demographic information to be collected in the study of parents of children with ASD; however, it is not always used as the primary variable of interest (Mugno et al., 2007). One study reported insufficient statistical power to compare parental coping strategies based on the single versus coupled household status (Twoy, Connolly, & Novak, 2007). Some studies have used the household status in their statistical analyses (Benjak, 2011; Bromley et al., 2004; Reed, Sejunaite, & Osborne, 2016). For example, one study that compared subjective QoL between parents of children with ASD and parents of children without a disability in Croatia conducted a logistic regression analysis with an independent variable of single versus coupled household status (Benjak, 2011). However, the focus of the previous studies that used the variable of the household status was not to investigate the parental experiences due to single versus coupled household status. This current study, therefore, intends to fill the gap in the study of parents of children with ASD through analysing various parental experiences, such as stress levels, coping styles, time use, and QoL that relate to single versus coupled household status.

Mothers’ experiences when there is a child with ASD in their families

To date, parental experiences, such as stress levels, coping styles, time use and QoL have been examined among mothers of children with ASD (Benson, 2010, 2014; Dardas & Ahmad, 2014a, 2014b, 2015; Mugno et al., 2007; Sawyer et al., 2010). Families of children with ASD tend to assume traditional family roles where mothers commonly hold the primary caregiver’s role (Nealy, O'Hare, Powers, & Swick, 2012; Pepperell, Paynter, & Gilmore, 2016). As primary caregivers, mothers are more likely to experience parenting related difficulties. One study that examined child related stressors, availability of resources, and coping strategies among parents of children with ASD found that mothers experienced higher levels of stress than fathers (McStay et al., 2014). Although parents of children with ASD use various coping styles, such as acceptance, humour, and gaining hope from child’s improvement (Marshall & Long, 2010), some coping styles used may be counterproductive or maladaptive (Hall & Graff, 2011; Sivberg, 2002). A recent longitudinal study, which was conducted over a seven-year period, on maternal coping styles and adjustment among mothers of children with ASD found that increased use of maladaptive coping styles was related to increased stress proliferation and distress, and decreased parental efficacy (Benson, 2014). It is therefore important to examine the parental coping styles, in particular those of mothers, given that mothers are commonly the primary organisers of the family schedules (Larson, 2000).

The role of being a mother is time intensive, especially when children have a disability (Olson & Esdaile, 2000). Compared with parents of typically developing children, parents of children with special needs spend longer time in childcare activities (Crowe & Florez, 2006; McCann, Bull, & Winzenberg, 2012). One study found that mothers of children with a disability engaged in childcare activities on average 13.1 hours more per week than mothers of children without a disability (Crowe & Florez, 2006). Parents of children with ASD were found to spend on average 43 hours per week in caring for their children (Järbrink, Fombonne, & Knapp, 2003). A consequence of increased childcare hours is a reduction of time available for other daily activities among parents, including personal leisure, work, and personal care (Brandon, 2007). Mothers feel physically and mentally exhausted by meeting this increased care needs, while not spending much time in personal care, such as sleeping (McGuire et al, 2004).

A recent systematic review found that the QoL of parents of children with ASD is lower than that of parents of typically developing children or the general population (Vasilopoulou & Nisbet, 2016). Various factors are associated with parents of children with ASD reporting lower QoL. These factors include increased challenging behaviours of the child with ASD (Dardas & Ahmad, 2014a; McStay et al., 2014; Tung et al., 2014), severity of ASD (Pozo, Sarria, & Brioso, 2014), lower household income (Dardas & Ahmad, 2014a), decreased levels of social support (Pozo et al., 2014), parental distress (Dardas & Ahmad, 2014a), and parental coping style (Dardas & Ahmad, 2014a; Pozo et al., 2014). The complex interplay between these factors should, therefore, be considered when describing the QoL among parents of children with ASD. Parents of children with ASD are often required to adjust many aspects in their life, including their family interactions, family lifestyles, marital relationships, work arrangement, coping styles, and their perspective of life (Ooi, Ong, Jacob,

& Khan, 2016). QoL is useful in capturing the complexity of the lives of these parents and should be considered in understanding the impact of having a child with ASD on parents (Dardas & Ahmad, 2014a).

Parental experiences among single mothers

The family structure has changed over the years in Western society due to the decreased marriage rates, the increased divorce rates, and the increased number of cohabiting couples (The Organisation for Economic Co-operation and Development [OECD], 2012). One of the notable family structural changes is an increase of single parent families. In Australia, by 2031 the rate of the single-parent families is projected to increase by between 40% and 77% (Australian Bureau of Statistics, 2010). Other OECD countries, such as UK and Norway, have projected similar trends of an increase of single parent families (OECD, 2012). In 2015, there were 617,800 single parent families with dependants living with them in Australia and of those, 84% were led by single mothers (Australian Bureau of Statistics, 2016). This over-representation of single parent families that are led by mothers is predicted to remain unchanged over the next fifteen years (Australian Bureau of Statistics, 2010).

Single motherhood, in general, presents some unique challenges, for example, additional time pressure in managing daily family responsibilities (Compas & Williams, 1990; Sachs, Hall, & Pietrukowicz, 1995) and financial pressures (Cooper et al., 2008; Sachs et al., 1995). One study that compared the experiences of single and coupled first-time mothers of typically developing infants found that single mothers experienced higher levels of stress than their counterpart (Copeland & Harbaugh, 2010). Both global (Witvliet, Arah, Stronks, & Kunst, 2014) and Australian (Crosier, Butterworth, & Rodgers, 2007) studies indicate that single mothers experience poorer physical and mental health outcomes compared to coupled mothers.

Single motherhood has been previously explored particularly within the area of social welfare and employment research (Cook, 2012b, 2012c; Herbst & Tekin, 2014; Wu, Wang, & Eamon, 2014); however, there is a paucity of research on single mothers of children with chronic health conditions, including children with a disability (Brown et al., 2008). Even fewer studies have been conducted with single mothers of children with ASD (Dyches, Christensen, Harper, Mandleco, & Roper, 2016). Given the challenges that single mothers face, combined with the unique factors identified among mothers of children with ASD, such as increased stress levels and lower QoL, there is a need to investigate the experiences of single mothers of children with ASD.

The aim of the study

The aim of the current study was to examine the influence of differences in household status (single versus coupled) on the stress levels, coping styles, time use and QoL among mothers of children with ASD. For the purpose of this study, we employed the definition of lone parent provided by the Australian Bureau of Statistics (2015) to define single mothers. Single mothers in this study are those who have "no spouse or partner usually resident in the household but who forms a parent-child relationship with at least one child usually resident in the household" (Australian Bureau of Statistics, 2015, para. 21).

Methods

Study design

The present study was part of a larger cross-sectional study that investigated the experiences of families of children with ASD in Western Australia. Researchers at Curtin University conducted this study in collaboration with the Disability Services Commission of Western Australia (DSC) and South-West Autism Network (SWAN). The larger study examined a number of topics related to the experiences of families of children with ASD, with a cross-sectional survey that consisted of the following four sections: (1) demographic information of the family, (2) the process of ASD diagnosis and access to health services, (3) the impact of having a child with ASD on family life, and (4) possible behavioural difficulties related to the characteristics of ASD. The survey was pilot tested with a convenient sample for clarify of questions, the flow of content, and estimating completion timeframe. The survey was refined following the pilot testing.

Participants

A parent or a primary caregiver of a 2 to 18 year old child or young person diagnosed with ASD living in Western Australia was eligible to participate in this study. The participants were recruited through the existing internal lists of families of children with ASD who agreed to participate in future research held at Curtin University and the Telethon Kids Institute; service providers, such as DSC and SWAN; ASD related events held at Curtin University; health professionals working with families of children with ASD; and media release on radio.

Instruments

Four measures were used in this current study: (1) The World Health Organisation Quality of Life BREF (The WHOQOL Group, 1998), (2) Autism Parental Stress Index (Silva & Schalock, 2012), (3) The Brief COPE (Carver, 1997), and (4) time use estimate table. All four measures were included in section three of the survey (i.e., the impact of having a child with ASD on family life).

The World Health Organisation Quality of Life Brief (WHOQOL BREF)

The WHOQOL BREF that is a short form of the WHOQOL-100 is a convenient and concise tool to use for studies in which QoL is of interest (The WHOQOL Group, 1998). It is possible to calculate four domains scores: physical, psychological, social relationships, and environment. Social relationships and environmental domains are often not included in other short version of QoL assessments (The WHOQOL Group, 1998). There are 26 items in total. Some examples of the items in the physical domain include pain and discomfort, energy and fatigue, mobility, and work capacity. In the psychological domain, items, such as positive and negative feelings, self-esteem, bodily image, and spirituality, are included. The social relationships domain includes personal relationships, social support, and sexual activity. In the environment domain, items, such as physical safety and security, home environment, financial resources, accessibility to services and its quality, and opportunities for leisure activity, are included (The WHOQOL Group, 1998). Two items are independent from these four domains: respondents' overall perception of QoL and their overall perception of health (The WHOQOL Group, 1996). A five-point Likert scale is used in WHOQOL BREF, and the respondents are asked to answer each item reflecting their experiences in the last two weeks (Skevington, Lofty, & O'Connell, 2004). Four domain scores are calculated using the mean score of each item within each domain, and in order to make the domain scores comparable with the WHOQOL-100, the mean scores are then multiplied by four (The WHOQOL Group, 1996). Each domain is reported to have acceptable internal consistency. The alpha levels reported for each domain are as follows: for the physical domain .82, for the psychological domain .81, for the social relationships domain .68, and for the environmental domain .80 (Skevington et al., 2004). Likewise, acceptable test-retest reliability of .66 for the physical domain, .72 for the psychological domain, .76 for the social relationships domain, and .87 for the environment domain over a two to four week period was reported (The WHOQOL Group, 1998).

Autism Parental Stress Index (APSI)

The APSI has an overall parental stress scale and three subscales that measure stress levels of parents of a child with ASD, specifically identifying the areas with which parents require further support (Silva & Schalock, 2012). These three subscales include (1) the core autism symptoms, (2) comorbid behaviours, and (3) comorbid physical issues. The results of the APSI validation suggests good internal consistency for the overall scale (Cronbach's alpha = .83). The acceptable internal consistency of .79 for the core autism symptoms; .76 for the co-morbid behaviours; and .67 for the co-morbid physical issue was reported. A good test-retest reliability of .88 was reported for the overall scale over a four-month period (Silva & Schalock, 2012).

Brief COPE

The 28-item Brief COPE was developed as a shorter version of the full COPE, and it measures 14 different coping styles (Carver, 1997). The 14 theoretically derived subscales that consist of two items per subscale represent different coping styles: (1) active coping, (2) planning, (3) positive reframing, (4) acceptance, (5) humour, (6) religion, (7) emotional support, (8) instrumental support, (9) self-distraction, (10) denial, (11) venting, (12) substance use, (13) behavioural disengagement, and (14) self-blame. The Brief COPE is a useful tool for researchers to assess a range of coping styles, whilst reducing participant response burden. Respondents are asked to rate each statement that describes a coping style on a 4-point scale that ranges from 'I haven't been doing this at all' to 'I've been doing this a lot. On average, adequate internal reliabilities (α ranged from .50 to .90) have been reported (Carver, 1997).

Time use estimate table

This constituted a 24-hour format table that participants completed to describe their average weekday and weekend day by providing estimated hours on each of the 14 activities presented. We chose these 14 activities from previous publications on time use of mothers of children with a disability (Gevir, Goldstand, Weintraub, & Parush, 2006; McCann et al., 2012). The fourteen activities listed in this study were (1) sleep, (2) grooming and personal hygiene, (3) meal preparations and clean up, (4) having a meal, (5) taking care of child, (6) travel time to and from school or work, (7) time spent at work, (8) personal leisure time, (9) house duties, (10) shopping, (11) having quiet time or down time, (12) visiting family/friends, (13) studying, and (14) voluntary work.

Procedures

The survey was made available in three different formats for completion: (1) an online version, (2) a telephone interview to complete the survey, or (3) a paper and pencil version to be returned via post. The online survey was available from January 2015 to December 2015. The paper and pencil version of the survey was distributed to prospective participants at several events, which were organised by the Curtin Autism Research Group (CARG) in 2015. Participants who completed the online survey (*n* = 150) provided consent to participate in this study by completing the survey. For those participants who completed the survey (*n* = 2) by telephone, a researcher read the scripted consent prior to starting the survey, and the participants' response was recorded in the electronic data entry form. The participants who completed the paper and pencil survey (*n* = 55) were asked to return the signed consent form to the research team. We have conducted a sensitivity analysis with all variables that went into the univariate analysis between those participants who completed the online survey and those who completed the paper and pencil version. There were no meaningful differences between the two forms of data collection on any of the variables. Due to the procedure used to collect data, it was impossible to calculate how many potential participants who received the survey, opted not to participate.

All data were entered directly by participants online or the researchers entered data from the telephone and the paper and pencil versions online. These data were stored on Curtin University's Qualtrics Web Server, which was password protected. A total of 248 surveys were completed. We removed those double or triple entries made by the same participants (*n* = 22) and only kept their latest entry in this current study. We also removed the entries made by fathers (*n* = 16) and by grandparents (*n* = 3) as the targeted population of the current study was mothers. In total, 207 were completed by mothers, including biological, step and foster, and thus were deemed relevant to the current study. For the purpose of this study, those 207 participants were categorised into coupled mothers and single mothers.

Data analyses

The Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp, 2013) was used to analyse data. The question on participant's household status was used to create a dichotomous variable, a coupled mother or a single mother. The participants chose their household status from the following seven options: (1) two-parent, (2) single parent, (3) extended family (grandparents), (4) two-parent plus extended family, (5) single parent plus extended family, (6) foster situation, and (7) other. The household status category of the coupled mother was formed by collapsing the two parent (*n* = 156) or the two-parent plus extended family options (*n* = 3). The household status category of the single mother was formed by combining the single parent (*n* = 39) and the single parent plus extended family options (*n* = 4). Those participants who chose the other option were included if further information to identify their household status (i.e. two-parent or single parent) was provided (*n* = 5). Those participants who chose the extended family option were not included in this current study. The newly created household dichotomous variable, a coupled mother or a single mother, was used as a dependent variable.

Although the structure of the coping styles with Brief COPE among parents of children with ASD has been previously explored (Benson, 2010; Hastings et al., 2005), both studies yielded different factor structures and had smaller sample size (N = 113; N = 135 respectively) than the current study (N = 207). Therefore, factor analysis was conducted to explore the structure of the coping styles that best fit to the current study participants. A principal component analysis of the 28 items using oblimn rotation was undertaken. The scree-test was used to determine the number of factors with the eigenvalue greater than 1.0 (Field, 2005; Osborne & Costello, 2009) and factor loading greater than 0.40. Eigenvalues greater than one indicated that the first five factors, which are listed in Table 1, explained 18%, 15%, 9%, 7%, and 6% of the variance respectively. The sixth and the seventh factors had eigenvalues of just over 1%, and they explained 5% and 4% of the variance respectively. Following the initial examination of the correlation matrix, the two items that form a subscale of substance use and another two items that form a subscale of use of religion were excluded, as their correlations were high ($r > 0.8$). The Kaiser-Meyer-Olkein measure indicated good sampling adequacy (KMO = .75) (Field, 2005). Bartlett's test of sphericity (X^2 (276) = 1724.67, $p = .001$) indicated that the correlation between each item was sufficient (Field, 2005). As a result, the five-factor solution explaining 56% of the total variance was used in the current study. Cronbach's alpha for each of the five-factor is reported in Table 1.

Unlike the previous two studies (Benson, 2010; Hastings et al., 2005) that reported four factors, our analysis yielded five factors with one item dropped. The dropped items was '*I have been turning to work or other activities to take mind off things'*, which is an item for the self-distraction subscale. The result of the factor analysis is presented in Table 1. Our factors somewhat resembled the result of Hastings et al. (2005) and hence their labels suited the current extracted factors. Factor one (problem focused) included all items of the planning and active coping subscales. This factor describes mothers' proactive coping styles to deal with stressors. Factor two (active avoidance) included all items of the self-blame, behavioural disengagement, denial and venting and one item from self-distraction subscales. This factor describes mothers' coping style to avoid stressors physically or emotionally. Factor three (positive coping) included all items of the humour and positive reframing subscales. This factor describes mothers' coping style to perceive stressors through their constructive lens. Factor four (lack of relational support) included all items of the emotional support and instrumental support and one item from venting subscales. This factor describes mothers' limited use of external support in dealing with stressors. Factor five (acceptance) included both items of the subscale of acceptance, and one item of the subscale of planning. This factor describes mothers' coping style to deal with stressors while adopting the situation.

<Insert Table 1 here>

A *chi*-square test was conducted to compare the relationship between single versus coupled household status and demographic variables. A univariate analysis was conducted to identify significant associations between single versus coupled household status and the scores for the WHOQOL BREF and the APSI, the extracted factors of the Brief COPE, and the number of hours reported in the time use estimate table. Binary logistic regression analyses were then performed with the significant variables to identify key factors associated with single mothers' stress levels, coping styles, time use, QoL, and demographic variables. A backward elimination method was used to develop the final model. In this method, all variables that were found significant in the univariate analysis were entered in the regression model initially and the least significant variable was removed one at a time until it reached the final model.

Results

Demographic information of participants

Table 2 provides an overall descriptive profile of the participants by single versus coupled household status. There were 43 single mothers (20.8%) and 164 coupled mothers (79.2%). Significant differences were found between single and coupled mothers on the following five demographic variables: (1) respondents' self-reported presence of cognitive impairment or intellectual disability with the child with ASD was higher among single mothers ($p = 0.009$), (2) total number of children was higher among coupled mothers ($p = 0.011$), (3) more single mothers were unemployed ($p < 0.001$), (4) household income was lower among single mothers ($p < 0.001$), and (5) single mothers had lower education levels ($p = 0.027$). No significant differences were found on any other demographic variables.

<Insert Table 2 here>

Univariate analysis

Univariate analysis was conducted to identify independent variables significantly associated with single versus coupled household status. The following independent variables were found to be significant: (1) WHOQOL BREF physical domain ($p = .003$), (2) WHOQOL BREF psychological domain ($p = 0.028$), (3) WHOQOL BREF social relationships domain ($p = 0.012$), (4) WHOQOL BREF environment domain ($p < 0.001$), (5) WHOQOL BREF overall QoL ($p = 0.001$), (6) WHOQOL BREF health satisfaction ($p = 0.39$), (7) factor two (active avoidance) coping style ($p = 0.001$), (8) factor five (acceptance) as coping style ($p = 0.008$), (9) estimated hours completing house duties during the week ($p = 0.04$), (10) estimated hours visiting family or friends during the weekend ($p = 0.049$), (11) APSI the core autism symptoms ($p = 0.013$), (12) APSI comorbid behaviour ($p = 0.027$), (13) APSI comorbid physical ($p = 0.014$), and (14) APSI overall scores for parental stress levels ($p = 0.002$). These significant independent variables were entered into the multivariate logistic regression analysis. Apart from the two variables, estimated hours completing house duties during the week and visiting family or friends during the weekend, there were no significant difference between single and coupled mothers in their estimated time use. No significant difference was found with the variables of coping style factor three (positive coping) and factor four (lack of relational support). These non-significant independent variables were excluded in the multivariate logistic regression analysis.

Multivariate logistic regression analysis

The model was tested for goodness of fit against a constant only model and was found to be statistically significant ($X^2 = 29.29$, $DF = 4$, $p < 0.001$). The included factors explained 21% of the variance (Nagelkerke $R^2 = .21$). The overall prediction success rate of the model was 80.3%. The Wald criterion was used to identify factors that were significantly associated with single mothers, and Exp (B) was used to predict the direction of the outcomes. Table 3 shows the results of the multivariate logistic regression analysis.

The multivariate logistic regression analysis revealed two factors that significantly contributed towards being single mothers: (1) WHOQOL BREF environment domain ($p < 0.001$); and (2) Factor five, acceptance as a coping style ($p = 0.006$). The current results showed that single mothers were 1.05 times more likely to report lower levels of QoL in the environmental domain (OR = 1.05; 95% CI = 1.04, 1.09). Although factor five (acceptance) was found significant ($p < 0.05$) in the multivariate logistic regression analysis (OR = 1.73; 95% CI = 1.17, 2.25), which indicates single mothers were 1.73 times more likely to use acceptance as a coping style, this result did not persist after adjusted for total number of children, household income and employment status in the analysis. The WHOQOL BREF environmental domain remained significant ($p = 0.004$) following this adjustment.

The following factors did not significantly contribute to the multivariate model: (1) WHOQOL BREF Physical health domain, (2) WHOQOL BREF Psychological health domain, (3) WHOQOL BREF Social relationships domain, (4) estimated hours completing house duties during the week, (5) estimated hours visiting family or friends during the weekend, (6) overall scores for parental stress levels, and (7) factor two (active avoidance) coping style.

<Insert Table 3 here>

Discussion

The aim of this current study was to examine the influence of differences in single versus coupled household status on the stress levels, coping styles, time use and QoL among mothers of children with ASD. The finding revealed that single mothers experience lower QoL in the environmental domain, whilst they use an adaptive coping style (acceptance) more to deal with everyday stressors.

Maternal Quality of Life

In this current study, single mothers reported lower levels of QoL in the environmental domain than coupled mothers. Financial hardship is a common issue among single mothers (Crosier et al., 2007; Dyches et al., 2016; Sachs et al., 1995; OECD, 2012), in particular if they are from working class background (Rowlingson & McKay, 2005). One of the reasons for single mothers to experience financial hardship may be due to a lack of suitable jobs, including those with flexible employment opportunity, which prevents those single mothers from obtaining full time employment. A study that examined the work force participation of single parents across 30 European countries found that single mothers were less likely to be employed full time than their counterpart, particularly while their children were young (Riggeri & Bird, 2014). Other factors, such as a lack of suitable childcare services, may also prohibit single mothers' abilities to obtain full time employment (Broussard, Joseph, & Thompson, 2012). In a meta-synthesis of single mothers' experiences of transitioning from welfare to work, the issues of the affordability, accessibility, and practicability of childcare services were found to exacerbate the already difficult transition process among these mothers in USA and Canada (Cook, 2012a). Having access to suitable childcare support can be a challenging issue among mothers of children with ASD (Bromley et al., 2004). It is, therefore, speculated that this issue maybe even more pronounced among single mothers of children with ASD.

Mothers are generally able to increase working hours as children mature and start attending school, and the difference in full time employment rates between single and coupled mothers narrows (Riggeri & Bird, 2014). However, mothers of children with complex needs, such as ASD, may need to seek part-time employment as the demand to cater for their children's unique needs (McCann et al., 2012; Sawyer et al., 2010) may continue through to young adulthood (Smith et al., 2010). In fact, parents of children with ASD report that reduced working hours and the associated loss in income are the single largest contributing factor to the cost of having a child with ASD (Horlin, Falkmer, Parsons, Albrecht, & Falkmer, 2014).

In Australia, social security payments were the largest source of income for 61% of single parent families in 2003 to 2004 (Australian Bureau of Statistics, 2007). A legislative change in Australia, which shifted some single parents to lower social security payments, resulted in these single parent families facing increased risk of poverty (The Australian Council of Social Service, 2012). In the current study, the single mothers reported lower household income than coupled mothers ($p < 0.001$), and more single mothers were unemployed ($p < 0.001$). Financial insecurity derived from a lack of flexible employment opportunity and insufficient social security payment among single mothers may have contributed to their lowered perceptions of QoL in the environmental domain.

This current study did not find differences between single and coupled mothers in the physical, psychological, and social relationships domains of QoL. This result may indicate that the status of being a single versus coupled household with a child with ASD does not have much impact on their QoL. It is also possible that both groups of mothers experience lower QoL compared to the general population, but there was no marked difference between the two groups. Indeed, one study has found that parents of children with ASD had lower QoL in every domain compared with the general population (Tung et al., 2014). Given that the current study did not have a control group, future research should consider comparing the QoL of these mothers with that of a control group to thoroughly understand the relative influence of being a single versus coupled household with a child with ASD.

Acceptance coping style

Single mothers were found to use the acceptance coping style more than coupled mothers. This finding is similar to a study by Compas and Williams (1990) where single mothers of typically developing young adolescents were found to use the acceptance and positive reappraisal coping style. Single mothers often need to cope with daily stressors without the support of an intimate partner, unlike coupled parents who have an option to share parental burden while supporting each other (Gray, 2006). In fact, coupled mothers consider spousal support critical in coping with stressors (Kuhaneck et al., 2010). Coupled parents can access a dyadic coping strategy, where they combine individual skills and capacities to deal with daily stressors or to support their partner in managing stressors (Bodenmann, 1995). In positive dyadic coping, couples can express and share stressful situations, receive both practical and emotional support from their partner, request for help in managing the stressors, and use a collaborative approach to cope with the stressors (Falconier, Jackson, Hilpert, & Bodenmann, 2015). However, single mothers simply do not have access to spousal support. Instead, family and other social supports play a crucial role in managing stressors and sharing parental responsibilities for single mothers of children with a disability (Levine, 2009; Muir, Tudball, & Robinson, 2008). Some of these mothers consciously build and maintain their social support networks, in preparation for the future needs of their children (Levine, 2009). However, finding reliable social support can be challenging due to multiple factors, for example, having to travel large geographical distances to access the support networks and having to train and empower people who lack knowledge and skills in caring for the child with complex needs (Muir et al., 2008). It may be plausible that given the complexity to establish and maintain reliable social networks, for single mothers of children with ASD, dealing situations by using the acceptance coping style maybe an easier option. While a lack of spousal and social support may be forcing these mothers to adapt the acceptance coping style, other factors may also be able to explain the current result.

The use of acceptance coping style did not remain significant after adjusting for total number of children, household income, and employment status. Our results suggest that those three demographic variables are critical in influencing the coping styles that single mothers adopt. Complex interactions between parental characteristics should be considered as coping is a process and is influenced by personal and situational factors (Folkman & Moskowitz, 2004). Another possible explanation of this result is that both single and coupled mothers of children with ASD are resilient. There is emerging evidence to show that families of children with ASD are resilient (Bayat, 2007; Bekhet, Johnson, & Zauszniewski, 2012; Tunali & Power, 2002). Despite the unique daily challenges, such as lack of public or family understanding towards ASD (Higgins et al., 2005; Nealy et al., 2012) and challenging behaviour of the child (Bromley et al., 2004), mothers of children with ASD show extreme commitments in caring for their children (van Tongerloo, van Wijngaarden, van der Gaag, & Lagro-Janssen, 2015). One study that explored the experiences of mothers of preschool children with ASD found that mothers developed hope and positive optimism over the years and their positive perspectives contributed towards their resilience (Bultas & Pohlman, 2014). In a study that compared the psychological functioning and coping styles of the mothers of children with ASD (*n* = 364) and the mothers of children without ASD (*n* = 61,408), it was found that mothers of children with ASD were 1.8 times more likely to report that they were coping better with daily parenting issues (Montes & Halterman, 2007). Parents of children with ASD develop more adaptable coping styles, such as acceptance over the years (Ooi et al., 2016), and the coping style of acceptance has been found to be a mediating factor between stress and QoL among parents of children with ASD (Dardas & Ahmad, 2015). Parents are able to deal with stressors in a practical manner by accepting situations (Marshall & Long, 2010). Acceptance is an indicator of resilience (Bekhet et al., 2012) that helps to unite families, which further strengthen their family relationships (Bayat, 2007).

Time use

This study did not find much difference in time use between single and coupled mothers. The current result may indicate that single versus coupled household status does not contribute to the difference in time use among mothers of children with ASD. A study conducted in Australia, found no statistically significant difference between single and coupled mothers in everyday time use (Craig & Mullan, 2012; Le & Miller, 2013). However, an earlier study that compared family life experiences between single and coupled mothers of children with a disability found that single mothers of children with a disability experienced more time pressures than coupled mothers (Schilling, Kirkham, Snow, & Schinke, 1986). In the current study, participants estimated hours for listed activities. Although time estimation method has previously been used with mothers of children with a disability (Padeliadu, 1998), it may not have fully captured the experiences of mothers or account for day-to-day variations. Future study should use more comprehensive data collection methods, such as an experience sampling method, to obtain more accurate information of mothers' time use (Chen, Cordier, & Brown, 2015; Cordier, Brown, Chen, Wilkes-Gillan, & Falkmer, 2016).

Maternal stress levels

This study did not find difference in parental stress levels between single and coupled mothers, which was similar to a previous research finding for mothers of children with a disability (Schilling et al., 1986). The instrument used in this study, the APSI (Silva & Schalock, 2012), measures parental stress levels that are specifically related to the characteristics of ASD and do not measure other parental stress factors, such as lowered income. Therefore, the results of the current study indicate that parents of children with ASD, regardless of single versus coupled household status, experience similar levels of parenting stress related to managing the characteristics of ASD. The demographic characteristics of the single mothers in this current study were reflective of common parental stress factors among single mothers in general (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009). Our single mother participants had on average lower household incomes, higher unemployment rates and lower educational levels compared with coupled mothers. Future research comparing single and coupled mothers of a child with ASD should consider using other instruments that measure broader stressors, such as financial pressures and lack of employment opportunities, as single mothers may be more prone to these stressors than their counterpart (Cook, 2012a; Sachs et al., 1995).

Limitation

The current study has several limitations. The data collected were only from mothers who resided in Western Australia. Several recruitment strategies were employed in this study and the researchers did not have access to the actual number of surveys that were distributed or the pool of participants that were approached. Although we incorporated drop out analyses in the online version of the survey, none of the participants provided data. Hence, we were unable to determine whether the profile of the non-respondents differed from the participants and this limits our ability to calculate the true response rate. Therefore, caution should be taken when generalising the findings. The current study did not have a control group. The use of a control group would be useful to understand the impact of the single versus and coupled household status on parental experiences. The focus of the current study was to compare the broader parental experiences between single versus coupled mothers, rather than the impact of the unique characteristics inherent to ASD. However, factors, such as communication difficulties and limited social skills, have been found to be associated with parental QoL (Baghdadli, Pry, Michelon, & Rattaz, 2014). Future studies examining parental experiences should consider these aspects. Lastly, the method used to collect time use data may have allowed participants to over or underestimate their time, which may have resulted in an inaccurate reflection of their time allocation. For example, in a previous study, time spent on childcare was overestimated when time estimate format was used to collect data (Järbrink et al., 2003). However, due to the design of this current study, we were unable to use other methods, such as daily diary entry, to collect data.

Conclusion

This current study discussed possible environmental issues surrounding single mothers of children with ASD, including a lack of flexible employment opportunity, insufficient social security payment and the resultant financial disadvantage. The environmental factors that are associated with single mother's QoL should be further explored with a focus on the economic aspect. Prior to adjusting for demographic variables, our results demonstrated that single mothers use acceptance coping style more in managing stressors. These differences should be further investigated, in particular the reason for the use of this adaptive coping style among single mothers in order to understand the underlying factors that may assist coupled mothers in turn. We did not find much difference in time use and maternal stress levels between these two mothers. However, time pressure is a common issue in single motherhood and previous studies have identified unique parental stressors among single mothers. The use of different methods, such as experience sampling method and the use of other stress measures, maybe beneficial in comparing single and coupled mothers whilst highlighting the vital differences.

Ethical approval

The study was approved by the Curtin University Human Research Ethics Committee (HR123/2014) and all procedures performed in this study were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in this study.

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