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RESEARCH ARTICLE

Exploring health-related quality of life determinants of New Zealand sole mothers

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International research has repeatedly linked sole motherhood to diminished levels of psychological and physical health. The purpose of the present study was to add to the limited amount of research on the health-related quality of life determinants in sole mothers, particularly in New Zealand. A sample of 263 New Zealand sole mothers recruited through a number of parent or women's networking groups completed a questionnaire on health-related quality of life, perceived stress and social support. Social support was positively associated with health-related quality of life irrespective of level of perceived stress, thus finding no evidence for a stress-buffering effect. The strongest protective factors against lowered health-related quality of life were social support and adult family members living at the same home, highlighting possible strategies to overcome inequalities in health-related quality of life.

Keywords: New Zealand; perceived stress; quality of life; social support; sole mothers

Introduction

Since 1975, the percentage of families in New Zealand headed by a sole parent has increased from just over 10% to 28%, with females outnumbering males in this role by approximately 5:1 (Ministry of Social Development 2010). Similar trends have been witnessed across most of the Western world, although not always to the same extent as in New Zealand. A research report comparing data from 22 developed countries shows New Zealand jointly sharing, with the United States, the rank of the country with the highest percentage of sole-parented families within its national population (Bradshaw & Finch 2002). The increased prevalence of sole parents per se may not necessarily be considered a problem, but the comparatively high proportion of sole parents experiencing significant health problems is concerning, thus prompting an increasing amount of research (Rousou et al. 2013).

The present study focuses on sole mothers, defined here as females who have in their full-time care at least one dependent child (a child

under the age of 18 years and not in full-time employment), and who are not living with someone they consider to be their partner or spouse. The pathways to sole motherhood are many: divorce, separation, death, imprisonment of a spouse or partner, accidental pregnancy when single, or a conscious choice to conceive or adopt a child as a single woman. Clearly, this demographic group is far from being homogeneous, with the added complexity of being a dynamic demographic group as some mothers move in and out of sole parenthood several times. While approximately a quarter of New Zealand families are headed by a sole mother, 46% of all mothers would have held the status of sole mother for at least one period of time by the age of 50 years (Dharmalingam et al. 2004).

Overseas studies consistently reported sole mothers to have diminished psychological health and substantially higher rates of depression (Brown & Moran 1997; Cairney et al. 1999; Wang 2004; Loxton et al. 2006), as well as significantly poorer general health and limiting

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longstanding illness than partnered mothers (Burstrom et al. 2010). In New Zealand, sole mothers were found to have significantly higher rates of self-reported mental health problems and higher rates of ever having been medicated for hypertension (Sarfati & Scott 2001). In a study on sole parents in New Zealand (which did not distinguish between sole mothers and fathers), Tobias et al. (2009) reported that 43% of sole parents met the criteria for a mental health classification in the year preceding the survey, compared to 19% for partnered parents. The prevalence of anxiety disorders, mood disorders, suicide ideation and substance abuse was more than double that of partnered parents. Worth & McMillan (2004) surveyed 244 sole mothers, sampled from social welfare recipients residing in one of three purposively selected socioeconomically diverse areas in New Zealand. The SF-36 (Ware et al. 1994) was used as a measure of self-reported health status in the study, with the results showing sole mothers' scores to be significantly lower than those of age-matched females of the general population on each of the eight scales. Psychological and general health inequalities experienced by sole mothers are thus well documented in the international as well as the New Zealand literature.

Various factors have been explored as potential predictors of health outcomes for sole mothers. Compared to partnered mothers, sole mothers are more likely to experience financial hardship (Brown & Moran 1997). According to 2009 data (Ministry of Social Development 2010), close to half of sole mothers in New Zealand were below the poverty line, defined as 60% of the median household disposable income and 25% deducted to allow for housing costs. And while two-parent families were only slightly more likely to have an income below the country's overall household median, 90% of sole-parented families were below the median. Low income and a disadvantaged socioeconomic position have generally been linked to diminished health in sole mothers (Rousou et al. 2013). Benzeval (1998) reported results from a nationally representative British survey between 1992 and 1995. Controlling for home ownership, consumer durables, access to cars,

employment and income reduced the health differential between sole mothers and partnered mothers by between 30% to 50%, depending on the outcome measure. Tobias et al. (2009) found socioeconomic position to contribute about a third to New Zealand sole parents' risk for mental health disorders.

Other important mediating variables between sole-parent status and mental health of mothers are perceived stress and social support. In a large Canadian nationally representative survey (Cairney et al. 2003), sole mothers rated their levels of perceived stress significantly higher and social support significantly lower than married mothers. These two variables explained 40% of the variance in the relationship between sole-parent status and depression. Sole mothers' mean scores were significantly lower for three measures of social support: perceived social support; frequency of participation in social groups; and frequency of social contacts. Longitudinal data (Avison et al. 2007), also from Canada, suggest that persistent and long-term exposure to stressors underlie the mental health differential between sole and married mothers. It is sole mothers' exposure to what the authors describe as a 'deluge' of stressors that underlies their vulnerability, rather than lack of ability to cope with stressors. In the absence of a spouse or partner, the source of social support is typically shifted to family members, friends and work colleagues, although it appears that such shifts are generally ineffective or insufficient. In a survey of Korean mothers, sole mothers reported to engage in less social activities than partnered mothers, and sibling support was self-reported to be less for sole mothers than for married mothers (Kim et al. 2010). Certainly, the way in which social support is expressed is likely to be very culture-specific, and generalisations to New Zealand sole mothers may not be warranted. However, the international literature does demonstrate that social support plays an important role in the relationship between sole motherhood and psychological wellbeing.

Evidence is not clear whether the health of sole mothers is altered if they live alone with their dependent child or children as opposed to with

another adult (Benzeval 1998). New Zealand data does, however, link co-residence to lowered risk of mental illness. Tobias et al. (2009) reported that lack of a co-residing adult was almost as strongly associated with psychiatric health risk than disadvantaged socioeconomic position. Another New Zealand report linked co-residence with a reduction of risk for depression in sole mothers by about a third (Ministry of Social Development 2010). In both cases, however, co-residence of another adult was used as a proxy for social support, and no distinction could be made between practical, financial or emotional support. Further research on the effects of different types of social support is thus necessary.

The majority of studies investigating the health effects of sole motherhood tend to use various diagnostic tools or other indicators of health status, and less is known about the correlates of sole motherhood with other outcomes, such as psychometric scales of quality of life (QOL), health-related quality of life (HRQOL), happiness or subjective wellbeing (Rousou et al. 2013). In health outcomes research, these types of subjective health indicators have gradually replaced objective ones such as health status (Camfield & Skevington 2008), and thus more data from subjective measures of sole mothers is needed. Cook et al. (2009) used the Personal Wellbeing Index (PWI) (Lau et al. 2005) to assess subjective wellbeing in Australian sole mothers as they made a mandatory transition from welfare to work, and found that scores across all domains of the PWI were lower than that of the general population. Similarly, Ifcher & Zarghamee (2014) reported that single mothers scored consistently and significantly lower than other women on a single-item question about happiness that was administered as part of a large annual social survey in the United States from 1972 to 2008. This limited evidence is consistent with the well-documented general health and psychological inequalities experienced by sole mothers.

The purpose of the present study was to add to the limited research on the HRQOL determinants in sole mothers by exploring the interrelationship between HRQOL, perceived stress, social support, income, co-residence and demographic variables.

Previous literature fails to account in sufficient detail for different types of social support, which was investigated in the present study by using the Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman 1983) as it distinguishes between different types of emotional and tangible support. As a measure of HRQOL, the brief version of the World Health Organisation Quality of Life (WHOQOL-BREF) instrument was used, which has recently been validated for use in New Zealand (Krägeloh et al. 2013).

Method

Participants

Sole mothers were recruited through a number of parent or women's networking groups in New Zealand. Eligibility criteria for the participants required that they were female, at least 18 years of age, lived in New Zealand, were the main caregiver of a dependent child/children who was/were under 18 years of age and was/were not in full-time employment, and did not live with anyone who they considered to be their spouse or partner.

A total of 263 participants completed the questionnaire. Respondent ages ranged from 19 to 62 years (mean = 34.93, SD = 8.68), with a median of 35. The majority of participants (82%) were single and not in either a casual or serious relationship. The Domestic Purposes Benefit (DPB; New Zealand social welfare payments) was received by 65% of the sample, and 58% of the overall sample had an income (from any source) of NZ \$600 per week or less. Full demographic details are presented in Table 1.

Instruments

The present survey employed three validated self-report questionnaires, followed by demographic items that inquired about participants' age, their living situation, income and related questions.

The Perceived Stress Scale (PSS) (Cohen et al. 1983) measures the degree to which an individual perceives their global stress levels and, in particular, how unpredictable and out of control the participant views their life during the preceding

Table 1 Participants' demographic characteristics.

Variables	<i>n</i>	%
<i>Total number of dependants at home</i>		
1 child	136	53.5
2 children	84	33.1
3 children	25	9.8
4 children or more	9	3.5
<i>Current situation</i>		
No relationship	214	81.7
Casual or serious relationship	48	18.3
<i>Time spent parenting alone</i>		
Never lived with father	57	21.7
For less than 1 year	34	12.9
For more than 1 year but less than 2 years	26	9.9
For more than 2 years but less than 5 years	72	27.4
For more than 5 years	74	28.1
<i>Number of adult family living in the house</i>		
0	170	69.4
1	39	15.9
2	25	10.2
3 or more	11	4.5
<i>Domestic Purposes Benefit recipient</i>		
Yes	171	65.3
No	91	34.7
<i>Employment</i>		
None	126	48.1
10 hours or less per week	41	15.6
Between 11 to 20 hours per week	24	9.2
Between 21 to 30 hours per week	22	8.4
Between 31 to 40 hours per week	33	12.6
Over 40 hours per week	16	6.1
<i>Income</i>		
Less than NZ\$300 per week	14	5.4
NZ\$301–400 per week	30	11.5
NZ\$401–600 per week	108	41.4
NZ\$601–800 per week	66	25.3
NZ\$801–1000 per week	21	8.0
More than NZ\$1000 per week	22	8.4

month. The present study employed the 10-item version of the scale (Cole 1999). Questions are presented with a 5-point Likert scale, with answer options ranging from 'never' to 'very often'. This scale was chosen because of its brevity, demonstrated good psychometric properties, and the fact that it has been used extensively by previous research across a broad range of population groups

(Cole 1999; Cohen & Janicki-Deverts 2012). Cronbach's alpha for the PSS was 0.90 in the present sample.

The ISEL consists of 40 statements that explore the perceived availability of social support (Cohen & Hoberman 1983; Cohen et al. 1985). Scoring on the 4-point Likert scale is as follows: 1 = 'definitely false'; 2 = 'probably false'; 3 = 'probably true'; and

4 = 'definitely true'. The ISEL can be analysed in terms of four 10-item subscales: 'tangible' measures the availability of material aid; 'appraisal' measures the availability of someone to talk with about one's problems; 'self-esteem' measures the perceived availability of others that allow a positive comparison of one's self with others; and 'belonging' measures the availability of people to spend time with. The ISEL has robust psychometric properties with low to moderate correlations between the four subscales (Cohen et al. 1985). In addition to these solid psychometric properties, this scale suited the purposes of the present study very well by providing a detailed profile of the various aspects of social support. All subscales also had very good reliability values in the present sample, with Cronbach's alpha values ranging from 0.84 to 0.92.

The WHOQOL-BREF is a 26-item short form of the WHOQOL-100 quality of life instrument (WHOQOL Group 1998) and has been validated for use in general population samples in New Zealand (Krägeloh et al. 2013). This self-report measure contains two global items about QOL and health and 24 items that belong to one of the following four domains: physical QOL (seven items); psychological QOL (six items); social relationships (three items); and environmental QOL (eight items). Domain scores were presented as sums of the relevant items. All items are rated on a 5-point Likert scale. Given New Zealand's diverse population, a scale with strong cross-cultural validity appeared advantageous (WHOQOL Group 1998), and the WHOQOL-BREF also possesses strong psychometric properties (Krägeloh et al. 2013). In the present sample, Cronbach's alpha values for the four domains ranged from 0.74 to 0.85.

Procedure

Ethics approval was granted by the researchers' institutional ethics committee. One of the researchers approached coordinators of a number of local and national parent and women's groups via telephone, email or in person. The groups were asked if they would assist in the promotion

of the study by way of a poster, an email to individuals in their database, or a notice on their webpage.

All promotional material showed a hyperlink to a SurveyMonkey website, which hosted the online survey. The opening page of the questionnaire required a response to confirm the eligibility criteria before participants could continue to the next page. An information sheet also featured on the opening page, which outlined the purpose and procedure of the present survey in detail. All items of the ISEL, PSS and WHOQOL-BREF required a response before the next page could be accessed, although an option was provided to indicate 'I prefer not to answer this question.' In the demographics section, responses were not compulsory, and therefore could be left blank.

Some of the coordinators of the groups that were approached suggested also using a paper-and-pencil version of the online survey so that participants without access to the Internet would be able to contribute. As a result, 40 questionnaires with pre-paid return envelopes were left behind at two parent group meetings. Of these 40 paper-and-pencil questionnaires, 13 were returned. It was not possible to estimate the response rate for the online survey as there was no way of knowing how many people received the online promotional material, or even how many people clicked on the hyperlink that directed them to the SurveyMonkey webpage.

Data analysis

All data were transferred from the SurveyMonkey website into a Microsoft Excel spreadsheet, and any cases with no responses to one of the three questionnaires were deleted. Many of these cases were due to participants accessing the online version but not completing the questionnaire at that time. There was no way of knowing if these participants did in fact return and commence another submission. Following these deletions, the sample size for the online questionnaire reduced from 310 to 250.

The percentage of missing items was less than 0.5. Following the procedure of previous WHOQOL studies in New Zealand (Krägeloh et al. 2015), missing WHOQOL-BREF data were

imputed by the rounded mean score of all other items in that domain. No imputation was conducted when at least half of the items in a domain were missing, in which case also no domain score was calculated. The same imputation method was applied to the PSS and the four subscales of the ISEL.

Analyses were carried out using the statistics software IBM SPSS 22.0. Due to the small percentage of paper-and-pencil responses (5%), and after tests by version had revealed no significant differences between the versions on the WHOQOL-BREF, it was decided to treat the sample as a single combined one. Prior to any analysis, scale summary scores were scrutinised to ensure that assumptions of parametric tests were met. Across all items, skewness and kurtosis values were generally within the commonly accepted range of -1.00 to 1.00 (Muthén & Kaplan 1985). Thirteen items across the PSS, ISEL and WHOQOL-BREF were marginally over these parameters for kurtosis (maximum -1.35), and only one item exceeded this range for skewness (-1.04).

The following analyses were conducted: First, correlation analyses were conducted for the WHOQOL-BREF (by domains), PSS, ISEL (by subscales) and continuous demographic variables. Second, to assess the extent to which perceived stress, social support and demographic factors can predict HRQOL, a series of multiple linear regressions was conducted. Given the study's goal to investigate the relationships between the variables mentioned above, which includes moderation effects between perceived stress and social support, multiple linear regression was a suitable data analysis method (Frazier et al. 2004).

The sample size met the requirement for the intended multiple linear regressions (Tabachnick & Fidell 2007). Multicollinearity checks were carried out and found acceptable VIF (< 10.0) and tolerance levels ($> .01$). Normality, linearity, homoscedasticity and independence of residuals were checked by sighting the residuals scatterplots and all were found to meet the required assumptions. Cook's distance was checked for any values above 1.00 , which would indicate the presence of an influential case skewing the parameters of the

data. All were found to be well below this cut-off. In preparation for the regression analyses, new centred variables were created for the four ISEL subscales, PSS and WHOQOL-BREF, as recommended by Frazier et al. (2004). This was done by subtracting the mean of each respective domain or subscale from each value, thus creating deviation units. The rationale behind performing this action is to lessen the correlation between the predictors and the moderator variable, therefore reducing multicollinearity (Frazier et al. 2004).

Results

The subscale means and standard deviations are shown in Table 2. Table 3 shows Spearman's rho correlation coefficients of the four social support subscales ('appraisal', 'belonging', 'self-esteem' and 'tangible') with the four WHOQOL-BREF domains, the PSS and the continuous demographic variables ('age', 'number of dependants', 'time spent parenting alone', 'number of adult family living in the house', 'hours worked' and 'income'). All four social support scales showed significant ($p < .01$) and moderate to high positive correlations with each other as well as with the four WHOQOL-BREF domains. Perceived stress (PSS) was also moderately negatively correlated with all of these scales ($p < .01$). 'Number of adult family living in the house' had small but

Table 2 Means and standard deviations (SD) for the raw (uncentred) summary scores for the four ISEL subscales, the four WHOQOL-BREF domains, and the PSS.

	Mean	SD
ISEL		
Appraisal	27.71	7.58
Belonging	26.49	7.26
Self-esteem	26.75	5.38
Tangible	25.68	6.82
WHOQOL-BREF		
Physical	24.30	4.77
Psychological	18.29	4.45
Social	8.48	2.91
Environmental	24.77	5.80
PSS	31.84	6.58

Table 3 Spearman's rho correlation coefficients for the four social support sub-scales (appraisal, belonging, self-esteem, and tangible) with the four WHOQOL-BREF domains, the PSS, and continuous demographic variables.

	Appraisal	Tangible	Self-esteem	Belonging	Physical QOL	Psych. QOL	Social QOL	Env. QOL	Perceived stress	Age	Num. dependants	Time apart	Adults co-habiting	Hours worked
Appraisal	–													
Tangible	.74**	–												
Self-esteem	.68**	.55**	–											
Belonging	.80**	.73**	.74**	–										
Physical QOL	.41**	.41**	.49**	.43**	–									
Psych. QOL	.53**	.44**	.70**	.57**	.59**	–								
Social QOL	.61**	.53**	.58**	.65**	.39**	.58**	–							
Env. QOL	.62**	.63**	.55**	.58**	.49**	.58**	.51**	–						
Perceived stress	–.50**	–.47**	–.58**	–.51**	–.49**	–.69**	–.52**	–.56**	–					
Age	.06	–.08	.20**	.13*	.09	.16**	.04	.08	–.13*	–				
Num. dependants	–.03	.04	.06	.05	–.04	.01	.10	–.04	.10	.07	–			
Time apart	.07	–.02	.12	.11	.06	.06	.08	.05	–.06	.32**	.12	–		
Adults co-habiting	.22**	.18**	.22**	.24**	.18**	.26**	.14*	.15*	–.23**	.05	–.02	.05	–	
Hours worked	.13*	.11	.15*	.14*	.20**	.16**	.05	.24**	–.16**	.27**	–.10	.20**	.01	–
Income	.23**	.16**	.21**	.24**	.16*	.09	.12	.25**	–.15*	.26**	.05	.21**	–.04	.59**

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

significant correlations with all subscales, and 'hours worked' and 'income' had small positive correlations with most of those subscales.

Hierarchical multiple linear regression analyses were undertaken with each of the WHOQOL-BREF domains as outcome variables. Predictors were entered in the following sequence of steps: 1. age, current situation, DPB, number of adult family living in the house, number of dependants, hours worked, income and time spent parenting alone; and 2. the four ISEL subscales (appraisal, belonging, self-esteem and tangible) and PSS. Demographic variables were therefore treated as fundamental, and the analyses investigated which additional effects social support and perceived stress have on HRQOL.

Results from the regression analyses are shown in Table 4. Apart from the regression with physical QOL as a predictor, where r^2 was .36 at step 2, the remaining models accounted for a relatively large proportion of the variance, with r^2 values ranging from .55 to .66. The variable 'number of adult family living in the house' was significant for each of the four regressions, with the WHOQOL-BREF scores being higher for those with at least one adult family member living with the respondent. The only other significant demographic variables were the association of 'current situation' (being in no relationship versus in a casual or serious relationship) with significantly higher values on the social domain and increased environmental QOL with increased 'income' (Table 4). 'Self-esteem' was a significant predictor of physical, psychological and social QOL. 'Belonging' was also a predictor of social QOL, and 'appraisal' and 'tangible' predicted environmental QOL.

Although not shown here, separate moderator analyses were conducted to investigate the presence of interactive effects between perceived stress and social support. None of the 16 moderator terms (four ISEL subscales \times four WHOQOL-BREF domains) yielded a significant result.

Discussion

Previous Australian and New Zealand studies have associated sole motherhood with diminished

psychological health (Sarfati & Scott 2001; Loxton et al. 2006; Tobias et al. 2009; Ministry of Social Development 2010), as well as with diminished health status (Worth & McMillan 2004). In order to be able to address any inequalities in health and HRQOL, a detailed understanding of the determinants of HRQOL is required. The present study found that higher levels of perceived stress were associated with lower scores on all four domains of the WHOQOL-BREF. Stress experienced during the process of becoming a sole mother may have a strong and long-lasting negative impact (Benzeval 1998), in addition to stress that results from the associated challenges of the new life circumstances (Brown & Moran 1997). Avison et al. (2007) evaluated the exposure and vulnerability of sole mothers to stressors in a Canadian longitudinal survey of 518 sole mothers who were compared with a demographically matched group of 502 married mothers. The authors found that the consistently higher levels of psychological distress of the sole mothers related more to greater exposure to stressors, rather than an inherent increased vulnerability.

Despite the comparatively large amount of chronic stress that sole mothers experience (Cairney et al. 2003), a number of factors play a protective role. Consistent with another New Zealand study (Tobias et al. 2009), the present study found 'number of adult family living in the house' to be positively associated with HRQOL. Additionally, those currently in a romantic relationship experienced higher social QOL. The benefits of social relationships were also detectable in the significant positive associations of the four ISEL social support subscales with HRQOL. In examining how social support may impact on health outcomes, the stress-buffering theory posits that social support is particularly helpful to those who are experiencing high levels of stress (Cohen & Wills 1985). In the present study, no significant interactions were found between perceived stress and any of the four ISEL subscales. The lack of support for the stress-buffering theory in the present study does agree with the results of Crosier et al. (2007), who tested the buffering effects of low versus high social support with the SF-36 as the outcome measure in a sample of 354 Australian

Table 4 Results from four separate hierarchical multiple linear regressions, each with one of the WHOQOL-BREF domains as the outcome variable.

Step	Variable	R ²	R ² change	B	p
Physical QOL:					
1		.09	.09		<.01**
	Age			-.01	.94
	Current situation			-.04	.53
	DPB			-.12	.26
	Number of adult family living in the house			.18	<.01**
	Number of dependants			-.04	.51
	Hours worked			.07	.54
	Income			.07	.41
	Time spent parenting alone			.04	.59
2		.36	.27		<.01**
	Perceived stress			-.23	<.01**
	Appraisal			.05	.66
	Belonging			-.14	.21
	Self-esteem			.31	<.01**
	Tangible			.20	.04*
Psychological QOL:					
1		.11	.11		<.01**
	Age			.14	.06
	Current situation			.08	.22
	DPB			-.11	.28
	Number of adult family living in the house			.25	<.01**
	Number of dependants			-.00	.95
	Hours worked			.03	.78
	Income			.01	.91
	Time spent parenting alone			-.02	.80
2		.66	.55		<.01**
	Perceived stress			-.48	<.01**
	Appraisal			-.00	.97
	Belonging			.03	.76
	Self-esteem			.41	<.01**
	Tangible			-.02	.74
Social QOL:					
1		.16	.16		<.01**
	Age			.07	.36
	Current situation			.32	<.01**
	DPB			-.11	.29
	Number of adult family living in the house			.18	<.01**
	Number of dependants			.09	.18
	Hours worked			-.17	.11
	Income			.15	.08
	Time spent parenting alone			.00	.98

(Continued)

Table 4 Continued.

Step	Variable	R^2	R^2 change	B	p
2	Perceived stress	.59	.43	-.21	<.01**
	Appraisal			.15	.08
	Belonging			.30	<.01**
	Self-esteem			.17	.02*
	Tangible			-.00	.99
Environmental QOL:					
1	Age	.15	.15	.01	.85
	Current situation			.11	.10
	DPB			-.12	.24
	Number of adult family living in the house			.20	<.01**
	Number of dependants			-.03	.67
	Hours worked			.04	.70
	Income			.21	.02*
	Time spent parenting alone			-.01	.93
2	Perceived stress	.55	.40	-.22	<.01**
	Appraisal			.20	.03*
	Belonging			-.15	.12
	Self-esteem			.12	.12
	Tangible			.39	<.01**

Demographic variables were entered as the first step, followed by PSS and the four ISEL subscales. Standardised beta coefficients are reported (β) as well as r^2 and p values.

sole mothers. Perhaps an explanation as to why the stress-buffering theory has not been supported in the present study is the lack of specificity between the available social support and the type of social support that is needed. Such specificity issues have been previously discussed by Cohen & McKay (1984) who argue that stress-buffering effects of social support will not occur if the availability of social support does not match the specific needs of the individual. In order to measure such specificity in social support, a complex and detailed study design would be required (Tetzloff & Barrera 1987). Although this was beyond the scope of the present study, the strength of the associations highlighted in our multiple linear regression analyses do indicate some of the areas where support can be most helpful, such as those that bolster self-esteem or provide tangible support.

The demographic variable 'income' was only significantly associated with the environmental QOL domain, and 'hours worked' failed to reach significance across any of the HRQOL domains. Other studies have shown socioeconomic variables such as financial hardship to be principal mediators between sole parenthood and psychological outcomes (Brown & Moran 1997). Hope et al. (1999), on the other hand, reported that socioeconomic factors play a moderating role, such that negative health effects of divorce were heightened when combined with downward mobility, such as in terms of housing tenure. However, while Loxton et al. (2006) found that middle-aged sole mothers were four times as likely than other women to suffer stress related to money, Cairney et al. (2003) reported income to have a modest impact on levels of depression in sole mothers. It may be that self-

reported income is an unreliable variable, confounded by receipt of non-monetary benefits, accommodation supplements, gifts and loans from friends and family, or the presence of accumulated assets. Future research is advised to employ more detailed assessments, such as those by Brown & Moran (1997) who used extensive interviewing to gauge financial hardship.

Additional limitations are that no information was collected on the type of work sole mothers engaged in and whether their child(ren) were in childcare. Given that lack of childcare has been identified as a major barrier for sole mothers accessing healthcare (Lee & North 2013), access to childcare may be an important co-variate to understanding the relationship between sole motherhood and HRQOL. Also no information was collected about the ethnicity of the participants. Although a New Zealand study (Worth & McMillan 2004) found that low socioeconomic status made a greater contribution to ill health than ethnicity, the interrelationships between HRQOL, socioeconomic status and ethnicity may be complex. Sarfati & Scott (2001) report the numbers of Māori sole mothers to be double that of the general population.

The links between the predictors and health outcomes highlighted in the present study are only correlational, which means that no statements can be made about causal pathways between these variables. Long-term longitudinal studies involving nationally representative samples of sole mothers (of which thus far there have been none in New Zealand) are needed to explore causal pathways, and track the psychosocial changes that sole mothers likely experience, such as periods of employment or how often dependants stay with their father or extended family. Other areas recommended for future research are those that would enquire into the functional aspects of social support; for example, who or what services provide what type and what quality of support.

Summary and conclusion

The present study adds to the limited research on HRQOL determinants in sole mothers. International studies exploring the psychological and

physical health of sole mothers consistently reports lower levels of health than for partnered mothers and single childless women. These inequalities require targeted interventions and effective public health policies, drawn from evidence-based research, in order for the current trends to change. The present study highlights the benefits of social support, in particular the type that bolsters self-esteem. These protective factors are just some of the areas which can inform the development and implementation of helping strategies. It is also important to consider that sole mothers are not necessarily inherently more vulnerable than other women, but tend to experience a greater amount of chronic stress (Avison et al. 2007). Therefore, the answers to addressing the inequalities of health for sole mothers may lie in both reducing the amount of stress they are under, as well as bolstering the protective factors that improve their health outcomes.

Disclosure statement

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