

## Single Mothers Have a Higher Risk of Mood Disorders

Mythily Subramaniam,<sup>1</sup>*MBBS, MHSM*, Rohini Omkar Prasad,<sup>2</sup>*MPH*, Edimansyah Abdin,<sup>1</sup>*PhD*, Janhavi Ajit Vaingankar,<sup>1</sup>*MSc*, Siow Ann Chong,<sup>1</sup>*MBBS, MMED (Psychiatry), MD*

### Abstract

**Introduction:** Previous research has shown single mothers to be at greater risk for both physical and mental health disorders as compared to married mothers. Psychiatric disorders, in particular depression, have been shown to be more prevalent in single mothers than married mothers. This study was aimed at comparing the prevalence of depression, other mood, and anxiety disorders in single and married mothers in a multiethnic Asian society. **Materials and Methods:** The Singapore Mental Health Study (SMHS) was a cross-sectional survey of the representative population of Singapore. The survey targeted Singapore residents aged 18 years and above. Trained interviewers established the diagnoses of mental disorders using the Composite International Diagnostic Interview version 3.0 (CIDI 3.0). Physical illnesses, social support and sociodemographic correlates were established using structured interviews. For the purpose of this study, single mothers were defined as unmarried, divorced/separated/widowed mothers who had children aged 21 years and below. **Results:** Face-to-face interviews were completed with 6616 respondents from December 2009 to December 2010. After controlling for sociodemographic correlates in multiple logistic regression model, single mothers had significantly higher odds of having mood disorders (OR = 5.28) as compared to married mothers. **Conclusion:** Our study found that single mothers in Singapore across ethnicities, experienced a higher risk for mood disorders as elsewhere in the world. Single motherhood was also associated with lower age and education. Our study identifies young, single mothers as a vulnerable group associated with mental illnesses that must be targeted with specific interventions to improve mental health and well-being.

Ann Acad Med Singapore 2014;43:145-51

**Key words:** Anxiety disorder, Major depressive disorder, Single mother, Social support

### Introduction

Changing family structures over the last few decades have led to the emergence of the single parent household as a common “alternative” family form. Similar to the trend in other parts of the world, Asian societies too are facing an increasing number of single-parent households.<sup>1</sup> Single-mother families are of interest as relatively little work has been done to study problems or difficulties, especially health consequences specific to their circumstances in the Asian context.

Singapore enjoys a status on par with other highly developed countries in terms of socioeconomic growth and demographic trends. The majority of Singapore residents belong to 1 of 3 Asian races; Chinese, Malay and Indian.<sup>2</sup> These societies traditionally favour the dual-parent family structure, with the family as the pillar of Asian society.<sup>3</sup> Government policy in Singapore also supports dual-parent

households over single-parent families. This is manifest in uneven benefits and subsidies accorded to “normal families” vs single-parent families in taxation, housing, welfare schemes and programmes aimed at improving fertility.<sup>4</sup>

Previous research has shown single mothers to be at greater risk for both physical and mental health disorders as compared to married mothers.<sup>5-7</sup> Psychiatric disorders, in particular depression, have been shown to be more prevalent in single mothers than married mothers.<sup>8-12</sup> Single mothers have also been found to have higher risk for other mood and anxiety disorders.<sup>13-16</sup> This may be attributed to risk factors that predispose to depression, such as gender, socioeconomic disadvantages, social support, etc., which are also associated with single parenthood.<sup>17</sup>

Single mothers have been found to experience greater levels of financial hardship than other family types.<sup>8,18,19</sup>

<sup>1</sup>Research Division, Institute of Mental Health, Singapore

<sup>2</sup>Saw Swee Hock School of Public Health, Singapore

Address for Correspondence: Dr Subramaniam Mythily, Research Division, Institute of Mental Health, Buangkok Green Medical Park, 10 Buangkok View, Singapore 539747.

Email: Mythily@imh.com.sg

Low educational levels and low income have also been associated with depressive symptoms in single mothers.<sup>20,21</sup> The association between employment and single mother status is somewhat unclear. In 1997, Brown and Moran found that among their sample of women from Islington, UK, single mothers were more likely to have full time employment than married mothers.<sup>8</sup> In contrast, Cairney et al found that single Canadian mothers were more likely to be unemployed.<sup>10</sup> Increased attention is also being paid to the health-related impacts of perceived social support on mothers. Single mothers have also been found to lack social support<sup>22-24</sup> and lack of social support has been associated with depression.<sup>25-27</sup>

Few epidemiological studies have compared the prevalence of psychiatric disorders in single and married mothers in Asia. Although it is now well established in many parts of the world that single mothers have an increased risk for psychiatric disorders, it is yet unclear whether similar differences occur in Asian societies and which factors contribute to it. The traditional cultural values of the 3 dominant ethnicities in the face of a “modern”, economically thriving metropolis like Singapore make for a unique experience of single motherhood; one that has not been explored much thus far. This study aims to: (i) compare the prevalence of depression, other mood and anxiety disorders in single and married mothers in Singapore, and (ii) determine the effect of sociodemographic correlates and perceived social support on the association of these psychiatric disorders among single mothers.

## Materials and Methods

### Sample

The Singapore Mental Health Study (SMHS) was a cross-sectional survey of the representative population of Singapore. The survey targeted Singapore residents (Singapore Citizens and Permanent Residents) aged 18 years and above. The sample size was calculated by estimating statistical power for single and two proportions to determine sample sizes required overall, as well as for subgroups (i.e. age and ethnicity) to produce a precise estimate with a margin of error equal to 0.05 for different disorders. Those of Malay and Indian ethnicity as well as those aged 65 years and above were oversampled to ensure that sufficient sample size would be achieved to improve the reliability of estimates for the subgroup analyses. Thus, a disproportionate stratified sampling (by age groups and ethnicity) was used where the 3 main ethnic groups (Chinese, Malays, and Indians) were sampled in equivalent proportion of about 30% each. The weighted data were then adjusted to represent the Singapore population based on the 2007 census. Face-to-face interviews were completed with 6616 respondents from December 2009 to December 2010. The

survey response rate was 75.9%. The sample for this study was selected from SMHS to include mothers who were single/unmarried (n = 10), married (n = 1510), divorced/separated (n = 97) and widowed (n = 21) with children aged 21 years and below (21 years is the year of majority in Singapore). The detailed methodology of the study has been described in a previous article.<sup>28</sup> The study was approved by the ethics committee (National Healthcare Group, Domain Specific Review Board) and all respondents and parents/guardians of respondents aged 18 to 20 years gave written informed consent for participating in the study.

### Measures

Trained interviewers established the diagnoses of mental disorders using the Composite International Diagnostic Interview version 3.0 (CIDI 3.0)<sup>29</sup> based on Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) (APA, 2000)<sup>30</sup> criteria. The psychiatric disorders included in this study were mood disorders including major depressive disorder (MDD), dysthymia and bipolar disorder; anxiety disorders including generalised anxiety disorder (GAD), and obsessive compulsive disorder (OCD); and alcohol use disorders i.e. alcohol abuse and alcohol dependence. Lifetime and 12-month prevalence of each disorder were established using hierarchy rules.

Health-related quality of life (HRQoL) was established using the Euro-QoL-5D (EQ-5D). The EQ-5D is a self-reported generic HRQoL instrument developed by the EuroQoL Group.<sup>31</sup> EQ-5D comprises a descriptive system and a visual analogue scale (VAS). The descriptive system assesses 5 domains (i.e. mobility, self-care, usual activities, pain/discomfort, anxiety/depression) and respondents were asked to rate their health on a 3-point severity scale (no problem/moderate problem/extreme problem). The EQ VAS records the respondent's self-rated health on a vertical, visual analogue scale where the endpoints are labelled ‘Best imaginable health state’ (100) and ‘Worst imaginable health state’ (0). The information can be summarised as a single score which represents ‘health utilities’ which are anchored at 0 (equal to death) and 1 (health state of full health). We used the UK time trade-off values<sup>32</sup> to convert the states to health utility scores.

Data on social support were collected using the CIDI Social Network module. This included questions on social network and perceived social support. Frequency of social contact was analysed using 2 questions that measured average number of contacts that the respondent had: (i) with relatives who do not live with them, and (ii) with friends. The questions to the respondents were, “How often do you talk on the phone or get together with relatives who do not live with you/friends?” The categories for answers were: Most every day, a few times a week, a few times a month,

once a month and less than once a month. Perceived social support was analysed using 4 questions: (i) How much can you rely on your relatives who do not live with you/friends for help if you have a serious problem and (ii) how much can you open up to relatives who do not live with you/friends if you need to talk about your worries. The categories for answers were: A lot, some, a little, or not at all. The scale was dichotomised with choices ‘a lot’ and ‘some’ indicating good social support and those that indicated ‘a little’ or ‘not at all’ were assumed to have poor social support. The paper and pencil version of the CIDI-3.0 (used for interviews in Bahasa Melayu language) combines the information on friends and relatives into a single question. Hence, the computer assisted personal interviewing (CAPI) data was combined for the 2 questions ie. perceived social support was computed as ‘good’ if the respondent endorsed at least ‘2’ (i.e. some) for either friend or relative for each domain.<sup>33,34</sup>

Disability was assessed with the Sheehan Disability Scale (SDS) which examined functioning in work, household, relationship, and social roles in the worst month of the past year. Responses were scored with a 0-to-10 visual analogue scale having response options labeled: none (0), mild (1 to 3), moderate (4 to 6), severe (7 to 9), and very severe (10). Respondents were also asked an open-ended question to estimate the number of days in the past 365 days when they were “totally unable to work or carry out your normal activities” because of depressive symptoms.

Sociodemographic data was collected using a structured interview. Data on age (at interview), gender, ethnicity, marital status, educational qualifications, employment, income and number of children was captured. Chronic physical conditions were assessed using a checklist adapted from the CIDI checklist of chronic medical disorders and the respondents were asked to report any of the disorders listed in the checklist.

### Statistical Analyses

Statistical analyses were carried out using the Statistical Analysis Software (SAS) System version 9.2 (SAS Institute, Cary, NC). To ensure that the survey findings were representative of the Singapore population, the data were weighted to adjust for oversampling and poststratified by age and ethnicity distributions between the survey sample and the Singapore resident population in 2007. Descriptive analyses were performed to establish the prevalence of lifetime and 12-month disorder as well as describe the sociodemographic profile of the study population. Analysis of variance was used to compare EQ-5D scores between 2 groups. We performed multiple logistic regression analyses to examine odds of having lifetime mental disorders and social correlates among single mothers versus married mothers after controlling for sociodemographic variables

including age, ethnicity, education, employment, income and number of children. Standard errors (SE) and significance tests were estimated using the Taylor series linearisation method. Multivariate significance was evaluated using Wald  $\chi^2$  tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was evaluated at the 0.05 level using two-sided tests.

### Results

Only 0.4% (n = 10) women in our sample reported that they were unmarried mothers, while 6.3% (n = 97) women reported that they were divorced/separated and 1.2% (n = 21) reported that they were widowed mothers with children aged 21 years and below. Given the small numbers of these groups, we combined them into a single category—‘single mothers’ with children aged 21 and below at the time of the study.

The sociodemographic characteristic of single and married mothers with children aged 21 and below is presented in Table 1. The study sample comprised 1638 respondents; with married mothers (92.2%) constituting the majority of the sample. Most of the single and married mothers were Chinese (73.7% and 74.3%), followed by Malays (17.2% and 15.3%), Indians (6.5% and 8.3%) and only 2.6% and 2.2% belonged to the ‘others’ ethnic groups. There was significant difference in terms of education and employment status between the 2 groups. The proportion of pre-university/junior college/diploma and university qualifications, were significantly higher in married mothers as compared to single mothers. Married mothers were significantly more likely to belong to the economically inactive group as compared to single mothers.

Table 2 shows the weighted prevalence of lifetime and 12-month mood, anxiety and alcohol disorders among single mothers and married mothers with children aged 21 and below. Lifetime and 12-month mood disorders were significantly higher among single mothers than married mothers. The prevalence of anxiety and alcohol disorders were also relatively more common among single mothers than the married mothers. After controlling for sociodemographic correlates in multiple logistic regression model, single mothers had significantly higher odds of having mood disorders (OR = 5.28) as compared to married mothers. There were no significant differences in the prevalence or odds of having any physical illness between the 2 groups (data available on request).

The proportion of single mothers who reported that they “open up” to relatives/friends (64%) was significantly lower as compared to married mothers. After controlling for sociodemographic correlates in multiple logistic regression model there were no significant differences between the 2 groups (Table 4). There were also no significant differences

Table 1. Sociodemographic Characteristics of Single Mothers and Married Mothers with Children Aged 21 and Below in the Singapore Mental Health Study (n = 1638)

	Single* Mothers 128 (7.81%)			Married Mothers 1510 (92.19%)			X <sup>2</sup>	P value
	n	%	SE	n	%	SE		
<b>Age (years)</b>								
18 to 34	29	18.35	4.40	363	19.80	0.37	0.117	0.943
35 to 49	75	64.68	5.75	917	64.41	0.49		
50 to 64	24	16.97	4.61	230	15.80	0.39		
<b>Ethnicity</b>								
Chinese	35	73.68	3.75	418	74.28	0.31	1.161	0.762
Malay	60	17.23	2.73	629	15.30	0.22		
Indian	29	6.52	1.36	419	8.26	0.13		
Others	4	2.57	1.25	44	2.16	0.11		
<b>Education</b>								
Pre-primary	7	5.61	2.99	34	1.25	0.34	31.790	<0.0001
Primary	33	26.07	5.63	240	13.99	1.26		
Secondary	57	43.03	6.34	599	39.44	1.81		
Vocational	11	8.43	3.51	76	3.94	0.66		
Pre-U/Junior college/Diploma	15	14.88	4.64	251	18.72	1.47		
University	5	1.97	0.98	310	22.66	1.55		
<b>Employment</b>								
Employed	102	85.59	4.20	890	68.32	1.70	27.951	<0.0001
Economically inactive	16	8.32	3.14	545	30.71	1.69		
Unemployed	9	6.09	3.01	29	0.97	0.28		
<b>Personal Income (Annual)</b>								
S\$19,999 and below	82	56.08	6.54	901	56.12	1.92	1.567	0.457
S\$20,000 to 49,999	32	33.24	6.27	360	27.58	1.73		
S\$50,000 and above	9	10.68	4.31	146	16.31	1.50		
<b>Number of Children</b>								
1 to 4	124	97.05	2.12	1459	98.47	0.30	0.787	0.375
5 and above	4	2.95	2.12	51	1.53	0.30		

\*Includes women who are single, separated, divorced and widowed.

Table 2. Weighted Prevalence of Lifetime and 12-Month Mood, Anxiety and Alcohol Disorders Among Single Mothers and Married Mothers with Children Aged 21 and Below (n = 1638)

	Single Mothers 128 (7.81%)			Married Mothers 1510 (92.19%)			P Value
	n	%	SE	n	%	SE	
Lifetime Mood Disorder	29	26.74	5.80	102	6.86	0.93	<0.001
Lifetime Anxiety Disorder	9	6.11	3.01	76	4.98	0.81	0.692
Lifetime Alcohol Use Disorder	4	1.46	0.81	10	0.64	0.28	0.2338
Any Lifetime Mental Disorder	34	30.23	5.96	159	10.25	1.11	<0.001
12-Month Mood Disorder	13	14.44	4.78	52	2.69	0.57	<0.001
12-Month Anxiety Disorder	5	3.14	2.13	34	2.46	0.59	0.7369
12-Month Alcohol Use Disorder	2	0.54	0.39	-	-	-	-
Any 12-Month Mental Disorder	16	17.06	5.07	74	4.44	0.76	<0.001

Table 3. Odds Ratios for Lifetime Mood, Anxiety and Alcohol Use Disorders of Single Versus Married Mothers Controlling for Sociodemographic Factors

	Mood		Anxiety		Alcohol		Any Mental Disorder	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Married Mothers	Ref.		Ref.		Ref.		Ref.	
Single Mothers	5.28	(2.47, 11.27)*	1.1	(0.33, 3.67)	1.52	(0.4, 5.69)	3.66	(1.83, 7.32)*
Number of Children	1.19	(0.87, 1.62)	0.69	(0.46, 1.06)	0.59	(0.18, 1.89)	1.07	(0.81, 1.42)
Age (years)								
18 to 34	2.92	(1.1, 7.72)†	1.86	(0.44, 7.99)	3.39	(0.38, 30.08)	2.26	(0.97, 5.31)
35 to 49	1.33	(0.56, 3.17)	1.73	(0.47, 6.42)	4.64	(0.44, 49)	1.32	(0.62, 2.81)
50 to 64	Ref.		Ref.		Ref.		Ref.	
Ethnicity								
Chinese	Ref.		Ref.		Ref.		Ref.	
Malay	0.68	(0.39, 1.17)	1.19	(0.67, 2.11)	2.0	(0.59, 6.85)	0.88	(0.56, 1.38)
Indian	0.96	(0.54, 1.68)	1.41	(0.78, 2.55)	1.98	(0.37, 10.52)	1.07	(0.67, 1.7)
Others	1.69	(0.58, 4.97)	0.46	(0.05, 3.86)	.	.	1.86	(0.73, 4.79)
Education								
Pre-primary	0.48	(0.07, 3.19)	0.51	(0.05, 5.49)	8.22	(0.77, 87.52)	0.56	(0.11, 2.99)
Primary	0.37	(0.1, 1.4)	1.26	(0.32, 4.89)	1.51	(0.17, 13.66)	0.54	(0.19, 1.57)
Secondary	0.74	(0.28, 2.01)	0.94	(0.32, 2.77)	2.76	(0.56, 13.57)	0.77	(0.34, 1.74)
Vocational	0.74	(0.21, 2.61)	0.27	(0.06, 1.19)	0.96	(0.07, 14.14)	0.62	(0.21, 1.86)
Pre-U/Junior college/Diploma	0.87	(0.35, 2.17)	0.73	(0.25, 2.09)	3.37	(0.27, 42.74)	0.78	(0.36, 1.66)
University	Ref.		Ref.		Ref.		Ref.	
Employment								
Employed	Ref.		Ref.		Ref.		Ref.	
Economically inactive	0.7	(0.33, 1.49)	0.59	(0.24, 1.48)	0.05	(0.01, 0.61)†	0.66	(0.35, 1.24)
Unemployed	1.68	(0.43, 6.54)	0.89	(0.17, 4.55)	.	.	1.62	(0.44, 5.99)
Personal Income (Annual)								
S\$19,999 and below	Ref.		Ref.		Ref.		Ref.	
S\$20,000 to S\$49,999	0.67	(0.32, 1.43)	1.82	(0.76, 4.34)	0.77	(0.14, 4.22)	1.01	(0.55, 1.88)
S\$50,000 and above	1.08	(0.4, 2.91)	1.47	(0.45, 4.87)	.	.	1.11	(0.48, 2.58)

\**P* value <0.01; †*P* value <0.05

Table 4. Weighted Prevalence and Odds Ratio of Social Correlates Among Single Mothers and Married Mothers with Children Aged 21 and Below (n = 1638)

	Single Mothers			Married Mothers			Single Mothers vs Married Mothers			
	n	%	SE	n	%	SE	<i>P</i> Value	OR*	95% CI	<i>P</i> value
Frequency of Contact										
Contact with Family Members	97	81.39	4.79	1315	86.86	1.28	0.214	0.64	0.30, 1.39	0.261
Contact with Friends	105	85.56	4.50	1141	76.19	1.61	0.0951	1.92	0.89, 4.14	0.094
Social Support										
Rely on Relatives/Friends	76	60.32	6.25	1050	71.60	1.68	0.0624	0.78	0.42, 1.43	0.418
Open up to Relatives/Friends	84	63.98	6.19	1078	76.56	1.53	0.0281	0.66	0.36, 1.20	0.170
Poor Interaction with Relatives/Friends	61	53.65	6.37	663	45.37	1.86	0.2115	1.34	0.74, 2.40	0.332

\*Multiple logistic regression controlled for sociodemographic factors include number of children, age, ethnicity, education, employment and income.

found between single mothers and married mothers with respect to EQ-5D VAS score and EQ-5D index score.

## Discussion

Consistent with other studies done around the world, single mothers had a significantly higher prevalence of mood disorders.<sup>8-12</sup> The prevalence of mood disorders was also found to be associated with age: younger mothers (aged 18 to 34 years) having nearly 3 times the risk than older women aged 50 to 64 years. This may be explained by the higher prevalence of MDD in younger women in general as reported in an earlier study.<sup>35</sup> Single motherhood may also present a greater challenge to younger women because of the lack of experience and maturity that comes with age. Additionally, they probably have a relative lack of resources and wealth while raising very young children. These combined factors could result in a decline of mental well-being not seen in older women. Though the prevalence of anxiety and alcohol disorders was higher among the single mothers, it was not significantly so. Studies on the association between anxiety disorders and single mothers are inconsistent, while some have shown significantly higher risk of anxiety disorders in single mothers,<sup>12,16,18</sup> other studies have failed to do so. Alcohol use disorder has not been studied to a great extent in single mothers. Cairney et al did find that previously married women (divorced/separated/widowed) had a higher prevalence for alcohol disorders than never married mothers.<sup>12</sup> However this (and other substance disorders) may be an interesting area to explore especially in comparison with single fathers who have been found to have higher prevalence in some cases.<sup>16</sup>

It was interesting to note that though married mothers were more highly educated on average than single mothers, they were more likely to belong to the economically inactive group. This is in line with the idea that single mothers as the only earning member of the household are required to be more economically productive than their married counterparts.<sup>13,17</sup> Brown and Bifulco<sup>36</sup> found that full time working mothers were at higher risk of having clinical depression than non-working mothers especially among single mothers as they more often experienced 2 or more measures of 'work strain' (measured by 'work overload', 'identity destructiveness', 'enjoyment', 'security diminishing characteristics' and 'unsatisfactory relationships') than married mothers, adding to the challenges of motherhood.

The assessment of severity of disability due to MDD (the most prevalent mood disorder in SMHS)<sup>35</sup> among the 2 groups using SDS revealed no significant differences between single and married mothers. However, we found that single mothers on an average reported lesser days in the last year when they were completely unable to work due to MDD (5.6 days in single mothers vs 35.1 days in married

mothers). This further corresponds with the need for single mothers to remain economically and functionally active in spite of serious health problems as the sole breadwinner, and, the lack of support from a partner or spouse.

The limitations of our study includes the small number of single mothers in the sample, necessitating the use of a single category to capture never married, as well as widowed, and divorced/separated mothers. Some studies have suggested that single mothers are a diverse group,<sup>18</sup> with never-married mothers occupying an intermittent position between married and separated/divorced mothers with regard to psychopathology<sup>14</sup> and that combining may lead to under/over estimation of risk factors. We also used the broad diagnostic category of mood disorder and did not separate those with MDD, dysthymia and bipolar disorder into three separate groups. As this was a cross-sectional study, we were unable to establish any causal relationships. While it is possible that the stress of single parenting leads to mood disorder, alternatively it is also possible that early onset of mood disorder prevented transition into marriage or recurrent episodes of the disorder lead to separation or divorce. We did not study distal stressors such as childhood abuse and other childhood traumas that may have a role in the association between single mothers and MDD.<sup>9,18</sup> As the information obtained was based on self-report, it was subject to recall bias on part of the respondents. However, the strengths of our study are that we used a structured instrument to establish the diagnosis of mood disorders and other psychiatric illnesses. This is also the first study examining the association of single mothers and psychiatric disorders in a multiethnic Asian country, and the relatively high response rate of 75.9% ensures the generalisability of our findings.

## Conclusion

In conclusion, our study found that single mothers in Singapore across ethnicities, experienced a higher risk for mood disorders as elsewhere in the world. Single motherhood was associated with lower age and education. The factors that moderate/mediate the relationship between single motherhood and mood disorders are not very clear, but it is reasonable to assume that sole-parenting responsibilities and the associated potential lack of resources (social and economic) would have a role to play. This has policy implications as it clearly identifies young, single mothers as a group for targeted intervention to improve mental health and well-being. The National Council of Social Services in Singapore runs Single-Parent Family Support Services, with the objectives of "supporting and promoting the psycho-emotional well-being of single-parent families towards stability, growth and acceptance of the new family unit". However, more needs to be done both in terms of

creating awareness, early detection and provision of client centred services for this group. Further research is needed both among larger samples, that could help tease out and identify mental health problems within subgroups of single mothers (never married, widowed, divorced/separated) and in longitudinal cohorts that could help us understand the relationship between the natural history of psychiatric disorders and family structures. This could also contribute to our understanding of the role of a major life event (divorce or bereavement) in the health and coping mechanisms of these women.

#### Acknowledgements

*This study was supported by funding from the Singapore Millennium Foundation and the Ministry of Health, Singapore.*

#### REFERENCES

- Park H. Single parenthood and children's reading performance in Asia. *J Marriage Fam* 2007;69:863-77.
- Department of Statistics, Ministry of Trade & Industry, Republic of Singapore. Census of Population 2010 Statistical Release 1, Demographic Characteristics, Education, Language and Religion, 2010. Available at: [http://www.singstat.gov.sg/publications/publications\\_and\\_papers/cop2010/census\\_2010\\_release1/cop2010sr1.pdf](http://www.singstat.gov.sg/publications/publications_and_papers/cop2010/census_2010_release1/cop2010sr1.pdf). Accessed 11 April 2013.
- Jones GW. The "Flight from Marriage" in South-East and East Asia. *J Comp Fam Stud* 2005;36:93-119.
- Wong T, Yeoh BSA, Graham EF, Teo P. Spaces of silence: single parenthood and the 'normal family' in Singapore. *Population, Space and Place* 2004;10:43-58.
- Berkman PL. Spouseless motherhood, psychological stress, and physical morbidity. *J Health Soc Behav* 1969;10:323-34.
- Ross CE, Mirowsky J, Goldstein K. The impact of the family on health: the decade in review. *J Marriage Fam* 1990;52:1059-78.
- Benzeval M. The self-reported health status of lone parents. *Soc Sci Med* 1998;46:1337-53.
- Brown GW, Moran PM. Single mothers, poverty and depression. *Psychol Med* 1997;27:21-33.
- Davies L, Avison WR, McAlpine DD. The University of Western Ontario significant life experiences and depression among single and married mothers. *J Marriage Fam* 1997;59:294-308.
- Cairney J, Thorpe C, Rietschlin J, Avison WR. 12-month prevalence of depression among single and married mothers in the 1994 National Population Health Survey. *Can J Public Health* 1999;90:320-4.
- Wang JL. The difference between single and married mothers in the 12-month prevalence of major depressive syndrome, associated factors and mental health service utilization. *Soc Psychiatry Psychiatr Epidemiol* 2004;39:26-32.
- Cairney J, Pevalin DJ, Wade TJ, Veldhuizen S, Arboleda-Florez J. Twelve-month psychiatric disorder among single and married mothers: the role of marital history. *Can J Psychiatry* 2006;51:671-6.
- Walters V. Stress, anxiety and depression: women's accounts of their health problems. *Soc Sci Med* 1993;36:393-402.
- Afifi TO, Cox BJ, Enns MW. Mental health profiles among married, never-married, and separated/divorced mothers in a nationally representative sample. *Soc Psychiatry Psychiatr Epidemiol* 2006;41:122-9.
- Crosier T, Butterworth P, Rodgers B. Mental health problems among single and partnered mothers: the role of financial hardship and social support. *Soc Psychiatry Psychiatr Epidemiol* 2007;42:6-13.
- Wade TJ, Veldhuizen S, Cairney J. Prevalence of psychiatric disorder in lone fathers and mothers: examining the intersection of gender and family structure on mental health. *Can J Psychiatry* 2011;56:567-73.
- Sperlich S, Arnhold-Kerri S, Geyer S. What accounts for depressive symptoms among mothers? The impact of socioeconomic status, family structure and psychosocial stress. *Int J Public Health* 2011;56:385-96.
- Lipman EL, Offord DR, Boyle MH. Single mothers in Ontario: sociodemographic, physical and mental health characteristics. *Can Med Assoc J* 1997;156:639-45.
- Targosz S, Bebbington P, Lewis G, Brugha T, Jenkins R, Farrell M, et al. Lone mothers, social exclusion and depression. *Psychol Med* 2003;33:715-22.
- Coiro MJ. Depressive symptoms among women receiving welfare. *Women Health* 2001;32:1-23.
- Patten SB, Wang JL, Williams JV, Currie S, Beck CA, Maxwell CJ, et al. Descriptive epidemiology of major depression in Canada. *Can J Psychiatry* 2006;51:84-90.
- Murata JE. Family stress, social support, violence, and sons' behaviour. *West J Nurs Res* 1994;16:154.
- Youngblut JM, Brady NR, Brooten D, Thomas DJ. Factors influencing single mother's employment status. *Health Care Women Int* 2000;21:125-36.
- Cairney J, Boyle M, Offord DR, Racine Y. Stress, social support and depression in single and married mothers. *Soc Psychiatry Psychiatr Epidemiol* 2003;38:442-9.
- Parker G, Ritch J. The influence of an uncaring partner on the type and outcome of depression. *J Affect Disord* 2001;66:207-14.
- Wade TD, Kendler KS. The relationship between social support and major depression: cross-sectional, longitudinal, and genetic perspectives. *J Nerv Ment Dis* 2000;188:251-8.
- Patten SB. Descriptive epidemiology of a depressive syndrome in a Western Canadian community population. *Can J Public Health* 2001;92:392-5.
- Subramaniam M, Vaingankar J, Heng D, Kwok KW, Lim YW, Yap M, et al. The Singapore Mental Health Study: An overview of the methodology. *Int J Methods Psychiatr Res* 2012;21:149-57.
- Kessler RC, Ustun TB. The World Mental Health (WMH) Survey Initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res* 2004;13:93-121.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. Washington, DC: Author, 2000.
- Rabin R, de Charro F. EQ-5D: a measure of health status from the EuroQol Group. *Ann Med* 2001;33:337-43.
- Kind P, Hardman G, Macran S. UK Population norms for EQ-5D. York Centre for Health Economics Discussion Paper 172. York: University of York, 1999.
- Thoits PA. Perceived social support and the voluntary, mixed, or pressured use of mental health services. *Society and Mental Health* 2011;1:14-9.
- Vaingankar JA, Subramaniam M, Abdin E, He YFV, Chong SA. "How much can I take?": Predictors of perceived burden for relatives of people with chronic illness. *Ann Acad Med Singapore* 2012;41:212-20.
- Chong SA, Abdin E, Vaingankar JA, Heng D, Sherbourne C, Yap M, et al. A population-based survey of mental disorders in Singapore. *Ann Acad Med Singapore* 2012;41:49-66.
- Brown GW, Bifulco A. Motherhood, employment and the development of depression a replication of a finding? *Br J Psychiatry* 1990;156:169-79.