

ORIGINAL PAPER

Anxiety and Depressive Symptoms among Communities in the East Coast of Peninsular Malaysia: A Rural Exploration

Wong Sok Yee¹, Lua Pei Lin¹

¹Centre for Clinical and Quality of Life Studies (CCQoLS), Faculty of Medicine and Health Sciences, Universiti Sultan Zainal Abidin (UniSZA), Kuala Terengganu, Malaysia

Abstract

Objective: This study intended to determine the prevalence of anxiety and depressive symptoms and to compare their severities among rural residents based on their socio-demographic variables. **Methods:** A cross sectional study was conducted among 520 residents in East Coast Peninsular Malaysia who completed the Malay Hospital Anxiety and Depression Scale (HADS). Data were analyzed with SPSS 17.0, whereby descriptive statistics and non-parametric tests were utilised for scores comparison. **Results:** The prevalence of mild anxiety and depressive symptoms was at 12.90% and 11.30% respectively. Statistically significant associations between gender and monthly income with anxiety and depressive symptoms were observed ($p < 0.01$). **Conclusion:** Findings in our study indicated that the prevalence of anxiety and depressive symptoms among rural residents was low. Nevertheless, females and those with higher education ($> PMR$) background were comparatively more prone to these mood disorders. Healthcare professionals should be constantly alerted to these tendencies in the process of providing medical services especially in rural areas.

Keywords: Anxiety, Depressive, Rural, Socio-demographic, Malaysia

Introduction

Mental health problems consistently exist in societies around the world and its incidence is rising globally. The recent rise in suicidal attempts and psychiatric disorders within our society had called for more vigilance in efforts to determine the amount, type, variety, and distribution of mental disorders in our increasingly modernised environment. However, most mental health services are

only easily accessible in urban areas. Rural communities worldwide are similarly facing the challenges in obtaining equitable and adequate mental and behavioural healthcare services¹⁻². Moreover, suicide rates are unexpectedly higher in rural communities than in metropolitan communities. As reported by Marther & Loncar (2006), the suicide rate of males aged between 15 to 24 years in remote areas was approximately twice that of their city counterparts³.

Anxiety and depression are two common mental health problems, and there is a growing awareness of the economic burden imposed by these disorders. Both psychiatric conditions frequently co-exist and are settings^{4,5}. About 150 million people suffer from depression at any point in time and nearly one million people commit suicide every year⁴. The World Health Organization (WHO) and the World Bank discovered that depression is the fourth most disabling disease in the world, and is predicted to be the second largest contributor to the overall disease burden by 2020^{4,5}. Anxiety disorders may also exert similar adverse effects as depression. However, scientific investigations on anxiety are less known compared to depression⁶.

Although there are differences in the prevalence of mental disorders by gender and age, mental disorders as a group of disorder are still very common in all countries⁷. Rural folks with psychiatric morbidity may be less likely to receive services than urban residents due to shortages in mental health professionals⁸. Because of this, the diagnosis for anxiety and depression among rural folks remains very challenging and under-detection is common. This leads to many under-diagnosed and under-treated cases although effective treatment exists⁹. Anxiety and depression are serious mental illnesses and they can profoundly affect QoL. Both disorders do not only cause psychological suffering but also impose physical effects to the body such as insomnia, restlessness and loss of appetite. Hence, undiagnosed and untreated symptoms may further enhance and prolong psychological suffering and suicidal mindsets¹⁰. Screening and prompt treatment are therefore important to solve the problems associated with anxiety and depressive symptoms. Studies investigating psychological distress among patients are

associated with social functioning, excess disability and worse quality of life (QoL). The evidence of high prevalence of depression and anxiety has been rising over the past 2 decades from a range of numerous, however only very few studies relate anxiety and depressive symptoms among rural residents in Malaysia.

Studies have revealed that community prevalence figures may vary between different countries depending on the population. For example, it is estimated that 2.6 million of the rural population in the United State of America suffer from depression and approximately 1.1 million rural residents experience anxiety¹¹. In Malaysia, it is estimated that anxiety and depression affects 10% to 30% of the population, but such data are mainly from patients who reside in urban areas¹²⁻¹³. Numerous studies have been conducted on the prevalence and determinants of mental health problems in Malaysia, but not many can be generalised because very few Malaysian studies had particularly targeted the rural residents. The current prevalence of psychological distress among rural folks in the East Coast of Peninsular Malaysia is also less-explored. As the rural residents are also at risk of anxiety and depressive symptoms, screening of psychiatric disorders is therefore just as important for them. To the best of our knowledge there is no other report examining the prevalence of anxiety and depressive symptoms among rural folks residing in the East Coast of Peninsular Malaysia.

The specific aims of this study were 1) to determine the prevalence of anxiety and depressive symptoms and 2) to compare anxiety and depressive symptoms based on socio-demographic characteristics- gender, monthly income, education level, and employment of the respondents.

Methods

Study design & sample selection

A prospective, cross-sectional study was carried out from April 2009 until January 2011. Respondents for the study were enrolled from the three states of the East Coast Peninsular Malaysia namely Terengganu, Pahang and Kelantan. The definition and identification of rural areas were confirmed utilising maps of local districts from “Jabatan Perangkaan dan Statistik Malaysia”. The inclusion criteria of the study consisted of 1) minimum age of 18 years old and above 2) Malay literate 3) able to give informed consent. Those who did not meet the inclusion criteria and not were not Malaysian citizen were excluded from the study. Cluster sampling was used and the calculation of sample size was according to comparative cross-sectional study formula¹⁴. The minimum sample size required for this study was 345 respondents.

Formula calculation

$$n = \frac{P_1(1-P_1) + P_2(1-P_2)(Z_\alpha + Z_\beta)^2}{(P_1 + P_2)^2}$$

$$n = \frac{0.2(1-0.2) + 0.11(1-0.11)(1.96 + 0.84)^2}{(0.2 + 0.11)^2}$$

$$n = 114.5 \quad \text{Hence, } n \approx 115$$

For three states $n \times 3$

$$n = 115 \times 3$$

$$n = 345$$

Where n = required sample size; P_1 = estimated proportion = 0.2¹³; P_2 = estimated previous proportion = 0.11; Power of $(1-\beta)$ = 0.80; α = level of significant; Z_α = value of the standard normal distribution cutting off probability α in one tail for one-sided alternative; Z_β = value of the standard normal distribution cutting off probability β ; Commonly used values are $Z_\alpha = 1.96$ for $\alpha = 0.05$ (two tailed); $Z_\beta = 0.84$ for 80% power.

Personal Particulars

The respondents were requested to provide their demographic information in a Personal Particulars form. This form consisted of 9 questions which included: age, gender, marital status, race, religion, education level, employment status, monthly income and living arrangement.

The validated Malay HADS

The HADS is a brief 14-item, self-administered questionnaire specifically designed for screening of anxiety and depressive symptoms. It has also been used for a wide range of respondents from non-clinical to clinical cases¹⁵⁻¹⁶. High reliability has been demonstrated in most samples¹⁷⁻²⁰. In this study, the validated Malay HADS was utilised²¹⁻²². The 14 item sample two subscales: anxiety (HADS-A) and depression (HADS-D). The anxiety and depression subscales were scored from 0 to 3 (four-point likert scales), giving maximum scores of 21 for anxiety and depression respectively. A score of 0 to 7 for either subscale could be regarded as being in the “normal” range. Subscale scores ranging from 8 to 11 represent “mild case”. For each subscale, scores from 12 to 14 is considered as “moderate case” and score of 15 or higher indicated “severe symptom”. In brief, any domain score ≥ 8 was considered as “case”.

Statistical analysis

Data was analyzed and processed using the SPSS version 17.0 for Windows. All socio-demographic data was analysed descriptively and presented as frequencies. The chi-square test for goodness of fit was used to determine the differences in the proportion of each categorical variable. Preliminary tests on normality of data distribution were carried out, in which the Kolmogorov-Smirnov statistics produced a value greater lesser than 0.05, indicating that the assumption of normality test was not

met. Internal consistency of the HADS-A and HADS-D was determined via the Cronbach's alpha coefficient. The associations between anxiety and depressive symptoms with gender, month income, education level, and employment of the respondents were assessed via chi-square test for independence. Mann-Whitney U was used for score comparisons between socio-demographic groups. A *p*-value of less than 0.05 (2-tailed) was considered to show statistical significance.

Results

Socio-demographic characteristics

Responses were received from 520

Volunteers from the East Coast regions of Peninsular Malaysia (Pahang = 74, Terengganu = 331, Kelantan = 115). The mean age of all participants was 41.9 years. Majority of the respondents were Malays (88.5%), males (43.8%), married (68.7%) and were living with partners (93.4%). Over 50% of the respondents had completed PMR education, earned less than RM 500 per month (USD≈164.5) and were employed during the study period. The more comprehensive demographic characteristics of the recruited respondents are presented in Table 1. In this study, the level of internal consistency reliability for both HADS subscales was reported to be high (HADS-A = 0.828, HADS-D = 0.846).

Table 1. Socio-demographic characteristics of respondents (N = 520).

Mean age ± SD (range)	41.9 ± 17.6 (18 - 98)		
	N	Percent (%)	<i>p</i> *
Gender			
Female	292	56.2	< 0.01
Male	228	43.8	
Marital status			
Married	357	68.7	< 0.001
Single/ divorced /widowed	163	31.3	
Race			
Malay	460	88.5	< 0.001
Chinese	51	9.8	
Indian	3	0.2	
others	6	1.5	
Religion			
Islam	471	90.6	< 0.001
Buddhist	44	8.5	
Hindu	1	0.2	
Christian	3	0.8	
Level of education			
No formal education	59	11.3	< 0.001
Primary school (UPSR)	145	27.9	
Secondary school (PMR)	79	15.2	
Junior high school	168	32.3	

Level of education

No formal education	59	11.3	< 0.001
Primary school (UPSR)	145	27.9	
Secondary school (PMR)	79	15.2	
Junior high school	168	32.3	
(SPM)	34	6.5	
High school (STPM)	25	4.8	
College (Diploma)	10	1.9	
University (Bachelor/Master)			

Employment status

Employed/Self-employed	266	51.2	> 0.05
Unemployed/Retired	254	43.8	

Income

* χ^2 tests for goodness of fit; $p < 0.05$ = significant.

Prevalence

The prevalence for mild anxiety and depressive symptoms was 12.9% ($n = 67$) and 11.3% ($n = 59$) respectively ($HADS \geq 8$). The total prevalence of respondents having both anxiety and depressive symptoms was 31.8% ($HADS \geq 8$). Moderate cases reported for anxiety and was 2.9% ($n = 15$) while for depressive symptoms was 3.3% ($n = 17$). Severe anxiety and depression (1.2%, $n = 6$) cases were also detected but majority of the respondents were in the normal range (non-anxiety cases = 83.1%, non-depression cases = 84.2%).

There were significant differences between groups with respect to gender and monthly income for both anxiety and depression cases. There were no significant associations detected between other socio-demographic variables with depressive symptom cases ($p > 0.05$). Females and those who earned less than RM 500 monthly revealed more anxiety and depressive cases. The prevalence and relationship of anxiety and depressive symptoms with socio-demographic characteristics are demonstrated in Table 2.

Table 2. Prevalence of anxiety and depression according to socio-demographic characteristics (N = 520).

	HADS-A		p value *	HADS-D		p value *
	No N (%)	Yes N (%)		No N (%)	Yes N (%)	
Gender						
Female	229 (53.0)	63 (71.6)	< 0.01	240 (54.8)	52 (63.4)	> 0.05
Male	203 (47.0)	25 (28.4)		198 (45.2)	30 (36.6)	

Monthly income						
< RM 500	234 (54.2)	58 (65.9)	< 0.05	250 (57.1)	188	> 0.05
> RM 500	198 (45.8)	30 (34.1)		42 (51.2)	(42.9)	
					40 (48.8)	
Education						
< PMR	243 (56.2)	40 (45.5)	> 0.05	241 (55.0)	42 (51.2)	> 0.05
> PMR	189 (43.8)	48 (54.5)		197 (45.0)	40 (48.8)	
Employment						
Employed	222 (51.4)	44 (50.0)	> 0.05	227 (51.8)	39 (47.6)	> 0.05
Unemployed	210 (48.6)	44 (50.0)		211 (48.2)	43 (52.4)	

*X² tests for independence; $p < 0.05$ = significant

Scores comparisons

Statistically significant associations between gender ($p < 0.01$), monthly income and education levels ($p < 0.01$) with anxiety scores were observed. Female respondents, those who earned less than RM 500 monthly and those with higher education level (> PMR), reported higher anxiety symptoms scores. There was no significant difference for anxiety levels reported between employment groups. Significant differences in depressive symptoms scores were shown between female and male, of which the former respondents were significantly more depressed ($p < 0.05$). Similar results were also demonstrated between education groups

whereby respondents with education level higher than PMR showed significantly greater depression level. There was no significant difference for HADS-D scores between those with different monthly income and employment status. Overall the number of anxiety cases and anxiety scores were clearly higher in female respondents compared to depressive symptoms. In Table 3, the comparison of HADS scores between socio-demographic groups are displayed. There are no consistent age group, race/ethnic and area differences in the prevalence of psychological distress, anxiety or depressive symptoms (data not shown).

Table 3. Overall score description of HADS subscales.

	HADS-A			HADS-D		
	Mean (±SD)	Median (IQR)	<i>P</i> *	Mean (±SD)	Median (IQR)	<i>P</i> *
Gender						
Male	3.14 (3.50)	2.00 (6.00)	< 0.001	3.07 (3.64)	2.00 (6.00)	< 0.05
Female	4.60 (3.99)	4.00 (6.00)		3.80 (4.03)	3.00 (6.00)	

Monthly income	4.51 (4.01)	4.00 (6.00)	< 0.001	3.42 (3.86)	2.00 (6.00)	> 0.05
< RM 500	3.25 (3.51)	2.00 (6.00)		3.56 (3.90)	2.50 (6.00)	
> RM 500						
Education						
< PMR	3.63 (3.85)	3.00 (6.00)	< 0.05	3.24 (3.90)	2.00 (6.00)	< 0.05
> PMR	4.34 (3.81)	4.00 (7.00)		3.78 (3.83)	3.00 (6.00)	
Employment						
Employed	3.68 (3.84)	3.00 (7.00)	> 0.05	3.29 (3.80)	2.00 (6.00)	> 0.05
Unemployed	4.24 (3.85)	4.00 (7.00)		3.68 (4.00)	3.00 (6.00)	

SD = standard deviation; * Mann Whitney U test; IQR = interquartile range; $p < 0.05$ = significant

Discussion

Understandably, depression and anxiety represent the most common forms of psychiatric disorders worldwide. Their existence is often related to disruption of QoL levels. Hence, early detection and prompt treatment of these psychological symptoms are necessary to avoid them being left unnoticed and untreated. In Malaysia, the prevalence of anxiety and depression has been frequently reported among different communities²³⁻²⁴, however very limited evidence is available on the psychological issues among rural folks particularly in the East Coast regions of Malaysia. In our study, we found that more than 10% of the respondents were anxious and depressed. Based on the scores of depressive symptoms, the prevalence of depressive symptom in our sample was almost similar with the rate found in an Australian study i.e 10%²⁵. However, our study's proportions of anxiety and depressive cases were lower as compared to a rural study in Pakistan²⁶. It also demonstrated a lower percentage of psychiatric morbidity than a previous survey

conducted among Malaysian¹³. This finding indicates that although the percentage was small, screening of mental health situation in rural folks should be routinely emphasised in case undetected symptoms become serious and debilitating.

The distribution of depressive symptoms among the selected sociodemographic groups in this analysis was generally consistent with a previous study which revealed that women and those with lower financial status were more likely to have met the criteria for depressive symptoms²⁷. Our study also discovered that there was a gender difference in the prevalence of anxiety and depressive symptoms. Our female respondents possessed higher rates of psychological symptoms than the males, and were generally more depressed and anxious. These findings are supported by several previous studies^{26,28-29}. In addition, according to the third National and Health Morbidity Survey, Malaysian females were also found to be 55% more prone to psychiatric problems¹³. Moreover, a past study had also found that about one in ten

females would be depressed as compared to one in twenty males²⁹.

Many factors could possibly contribute to this tendency of anxiety and depressive symptoms among women. Among the major causes include developmental, reproductive, hormonal fluctuation (during premenstrual, childbirth, infertility, postpartum and menopause), genetic and other biological differences³⁰⁻³². In addition, rural women of low socioeconomic status are also more likely to encounter financial problems, issues of unemployment or underemployment, discrimination, lack of education, and single parenthood³³. Therefore, it is not unexpected that females possess higher risk of anxiety and depression problems. Even though not fully understood, other potential contributors could also be related to responses to stressful life events, genetic predisposition, and hormonal differences were reported³⁴.

Significant differences in the psychological problems between groups with different monthly income only existed in the anxiety dimension, which showed that the rural residents who earned an income of less than RM 500 per month were more vulnerable to the symptoms. These outcomes are similar with a previous study which reported that individuals with lower income were more prone to anxiety²⁹, problems which might be attributed to the irregular and unpredictable earnings as most of them were self-employed. Furthermore, many of the rural folks were fishermen and farmers. It was also possible that with such inconsistent income, it is difficult to bear the many living necessities (even food) and they were also unable to afford a better living condition. Interestingly, depressive cases were not found to be related to monthly income. Those who earned less than RM 500 per month also did not differ in terms of

depressive symptom scores from those who earned more. Uniquely, our findings were not in keeping to the findings that are usually cited in literature- that anxiety and depressive symptoms were significantly associated with lower income and employment^{2,26,35}. Again ironically in our results, employment status too did not show any relationship with the anxiety and depressive symptoms in terms of score and the number of cases. This was probably because majority of the rural folks were self-employed and therefore obtaining a job which does not require a high level of education was not influential towards their psychological situation.

Education has been widely identified as a predictor of health outcomes as it shapes occupational opportunities and earning potential, which consequently affect living standards³⁶. Apart from that, education also provides basic knowledge and life skills to get better access to information and resources for health promotion during our lifespan. As anxiety and depressive symptoms are subjective emotional outcomes, individual with different levels of educational attainment can perceive the dimensions differently. Previous studies had discovered that individuals with higher literacy were associated with lower levels of anxiety and depressive symptoms³⁷⁻³⁸. Although between education groups (\leq PMR or $>$ PMR), the number of cases of both symptoms were about the same in our sample, the scores in particular were shown to be interestingly higher among rural folks with higher literacy. It might have reflected that more literate respondents probably possess higher demands and expectations in life compared to their less-educated counterparts. Our study also suggested that acquiring higher education might have given the individuals sufficient edge over the illiterates with regard to employment and

job prospects but the status somehow places greater burden on their emotions. In the other words, the more the respondents know; the more prone they are to anxiety and depressive symptoms³⁹. In contrast, a previous Malaysian study discovered that the proportion of psychiatric disorders was greater among low literacy Malaysian¹³, hence the exact reasons in our rural sample need to be further investigated.

The main limitation of the present work is that all the recruited respondents were not highly educated, earning low income, and mostly came from a single geographic area (Terengganu). Consequently, these data are not nationally representative, so conclusions could not be generalised to all rural areas in Malaysia³³. In our study, we did not have an actual confirmation on whether the rural folks could really identify/recognize symptoms of anxiety or depression. Thus, the self-report of anxiety and depressive symptoms might have not been the most accurate identification. Proper psychiatric diagnostic interviews were also not applied in this research which would have strengthened the diagnosis. Therefore studies in the future should incorporate the diagnostic interview if possible.

Conclusions

The majority of respondents who participated in our study were Malays, not highly educated, and were earning a low income. Our findings generally indicate that the prevalence of anxiety and depressive symptoms among rural residents from East Coast Peninsular Malaysia was rather low. Nevertheless, females and those with more than PMR qualification were relatively more prone to these mood disorders. In addition, rural folks with a lower monthly income were also found to be more vulnerable to anxiety symptoms. Further longitudinal studies that compare the associations and

reasons for the discrepancies in emotional disorders particularly anxiety, depressive symptoms between rural and urban dwellers are warranted. Comprehensive mental health interventions are also required to prevent and treat anxiety and depressive symptoms in these strata of the population.

Acknowledgement

The authors would like to acknowledge and thank all volunteer respondents for their involvement and support in this study. We are also grateful to the following people: Prof. Dr. Ahmad Zubaidi Abdul Latif, Mr Suffian Mohamad Tajudin, Mr. Mohd Najwan, Mr. Azliyadi Mohamad, Mr. Mohd Syazwan Abdul Majid, Mr. Mohd Yasin Mohamed, Mr. Andrew Kwok, Mr. Chua Han Ming, Ms. Wee Po Shan, Dato Loke Wai How, Mr. Chong You and Ms. Neni Widiasmoro Selamat for facilitating the data collection process. This study has been approved by the faculty's research committee.

References

1. Merwin E, Hinton I, Dembling B, Stern S. Shortages of rural mental health professionals. *Arch Psychiatr Nurs.* 2003;17(1):42-51
2. Morley B, Pirkis J, Naccarella L, Kohn F, Blashki G, et al. Improving access to and outcomes from mental health care in rural Australia. *Aust J Rural Health.* 2007;15(5):304-12
3. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med.* 2006;3(11): e442

4. World Health Organization. 2001. The world health report 2001: mental health, new Understanding, new Hope. [cited 2011 Jan 12]. Available from URL: http://www.who.int/whr/2001/en/w hr01_en.pdf
5. World Health Organization. 2006. Mental health. [Cited 2007 July 16]. Available from URL: http://www.who.int/mental_h ealth/management/depression/defin ition/en/
6. [Roy-Byrne PP](#), [Davidson KW](#), [Kessler RC](#), [Asmundson GJ](#), [Goodwin RD](#), et al. Anxiety disorders and comorbid medical illness. *Gen Hosp Psychiat*. 2008;30(3):208-225
7. World Health Organization. 2002. Regional strategy for mental health. 1-23
8. Diala CC, Muntaner C. Mood and anxiety disorders among rural, urban, and metropolitan residents in the United States. *Community Ment Health J*. 2003;39(3):239-52
9. Leon AC, Portera L, Weissman MM. The social costs of anxiety disorders. *Br J Psychiat*. 1995;166(27):19-22
10. Pirl WF. Evidence report on the occurrence, assessment, and treatment of depression in cancer patients. *J Natl Cancer Inst Monogr*. 2004;32:32-39
11. Probst JC, Laditka S, Moore CG, Harun N, Powell MP. Depression in rural populations: prevalence, effects on life quality, and treatment-seeking behavior. *South California Research Centre*. 2005;1-50
12. Malaysia Psychiatry Association. 2006. Depression. [cited 2011 Jan 12]. Available from URL: <http://www.psychiatry-malaysia.org/article.php?aid=56>
13. Malaysia Mental Health Association. 2006. National and Health Morbidity Survey 2006. [Cited 2011 March 21]. Available from URL: [http://www.mentalhealth.org.my/in dex.cfm?menuid=6&action=newsvi ew&retrieveid=131](http://www.mentalhealth.org.my/index.cfm?menuid=6&action=newsvi ew&retrieveid=131)
14. Naing NN. A Practical guide on determination of sample size in health sciences research. *Universiti Sains Malaysia*. 2009;3:54-55
15. Bjellanda I, Dahlb AA, Hauge TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale: An updated literature review. *J Psychosom Res* 2002; 52: 69– 77
16. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiat Scand*. 1983;67:361–370
17. Ariaratnam S, Devi A, Kaur G, Sinniah D, Suleiman A, Thambu M, et al. Psychiatric morbidity and survival in newly diagnosed treatment naive cancer patients – A study from Malaysia. *Biomed Res*. 2008;19(2):113-116
18. Carroll BT, Kathol RG, Noyes R, Jr, Wald TG, Clamon GH.

- Screening for depression and anxiety in cancer patients using the Hospital Anxiety and Depression Scale. *Gen Hosp Psychiat*. 1993;15:69–74
19. Osborne, R.H., Elsworth, G.R., Sprangers, M.A.G., Oort, F.J., Hopper J.L. The value of the Hospital Anxiety and Depression Scale (HADS) for comparing women with early onset breast cancer with population-based reference women. *Qual Life Res*. 2004;13:191–206
 20. Harter MK, Reuter K, Aschenbrenner A, Schretzmann B, Marschner N, et al. Psychiatric disorders and associated factors in cancer: results of an interview study with patients in inpatient, rehabilitation and outpatient treatment. *Eur J Cancer*. 2001;37:1385-1393
 21. Hatta SM, Hamid AR, Jaafar R, Hamed N, Jalil NF, Mustafa N. Depressive symptoms among women after abortion. *Malaysian J of Psychiatry*. 1997;5:27-33
 22. Lua PL, Wong & Selamat. 2010. Anxiety and depressive symptoms and health-related quality of life among patients with cancer in Terengganu, Malaysia. . *ASEAN J Psychiatry*. 2011: 12(1). Available from URL: http://www.aseanjournalofpsychiatry.org/online_12_1_03.htm
 23. Malaysia Psychiatry Association, 2008. More youngsters having mental issues. [cited 2011 March 28]. Available from URL: <http://www.psychiatry-malaysia.org/article.php?aid=894>
 24. Sherina MS, Lekhraj R, Mustaqim A. Physical And Mental Health Problems Of The Elderly In a Rural Community Of Sepang, Selangor. *Malaysian J Med Sci*. 2004;11(1):52-59
 25. Kilkkinen A, Kao-Philpot A, O'Neil A, Philpot B, Reddy P, et al. Prevalence of psychological distress, anxiety and depression in rural communities in Australia. *Aust J Rural Health*. 2007;15(2):114-9.
 26. Luni FK, Ansari B, Jawad A, Dawson A, Baig SM. Prevalence of depression and anxiety in a village in Sindh. *J Ayub Med Coll Abbottabad*. 2009;21(2):69-72
 27. Kessler RC, Berglund P, Demler O, Jin R, Koretz et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA*. 2003;289:3095–105
 28. Keller U, Henrich G. Illness related distress; Does it mean the same for man and women? Gender aspects in cancer distress and adjustment. *Acta Oncol*. 1999;38:747-755
 29. Perveen G, Pandya P. Depression and anxiety status in Kansas. 2008 Behavioral Risk Factor Surveillance System. Kansas Department of Health and Environment. 2009;1-68

30. Mental Health America of Illinois. Depression in women. 2000. [cited 2011 March 28]. Available from [URL:http://www.nmha.org/index.cfm?objectid=C7DF952E-1372-4D20C8A3DDCD5459D07B](http://www.nmha.org/index.cfm?objectid=C7DF952E-1372-4D20C8A3DDCD5459D07B)
31. Kendler KS, Prescott CA. A population-based twin study of lifetime major depression in men and women. *Arch Gen Psychiatry*. 1999;56:39-44
32. Noorbala AA, Bagheri-Yazdi SA, Yasamy MT, Mohammad K. Mental health survey of the adult population in Iran. *BJP*. 2004;184:70-73
33. Stress management health centre. Highly educated workers more stressed. Poorer mental health, job stress linked to higher education. WebMD health news archive. 2003. [cited 2011 March 29]. Available from [URL: http://www.webmd.com/balance/stress-management/news/20030418/highly-educated-workers-more-stressed](http://www.webmd.com/balance/stress-management/news/20030418/highly-educated-workers-more-stressed)
34. National Institute of Mental Health. Women and depression: discovering hope. US Department of Health and Human Services, National Institute of Mental Health; 2009. [cited 2011 Jan 12]. Available from [URL:http://www.nimh.nih.gov/health/publications/women-and-depression-discovering-hope/index.shtml](http://www.nimh.nih.gov/health/publications/women-and-depression-discovering-hope/index.shtml)
35. Fukuda Y, Hiyoshi A. Influences of income and employment on psychological distress and depression treatment in Japanese adults. *Environ Health Prev Med*. 2011; [cited 2011 March 28]. Available from URL: <http://www.springerlink.com/content/u038245484854877>
36. Adler NE, Newman K: Socioeconomic disparities in health: pathways and policies. *Health Affairs*. 2002;21(2).
37. Husain N, Chaudhry IB, Afridi MA, Tomenson B, Creed F. Life stress and depression in a tribal area of Pakistan. *Br J Psychiatry*. 2007;190:36–41.
38. Lubetkin EI, Jia H, Franks P, Gold MR: Relationship among sociodemographic factors, clinical conditions, and health-related quality of life: Examining the EQ-5D in the U.S. general population. *Qual Life Res*. 2005;14:2187-2196.
39. Swami, V., Loo, P-W & Adrian Furnham, A. 2009. Public knowledge and beliefs about depression among urban and rural Malays in Malaysia. *Int J Soc Psychiatry*. 56 (5), 480-496

Corresponding Author

Pei Lin Lua

Centre for Clinical and Quality of Life Studies (CCQoLS),
Faculty of Medicine and Health Sciences,
Universiti Sultan Zainal Abidin (UniSZA),

Kampus Kota, Jalan Sultan Mahmud,
20400 Kuala Terengganu, Malaysia
Telephone No: +6017-6228430, +6010-9002103
Fax No: +609-6275639

E-mail: peilinlua@unisza.edu.my