

ORIGINAL ARTICLE

PREVALENCE OF DEPRESSIVE DISORDER AND ITS ASSOCIATION WITH PERCEIVED SOCIAL SUPPORT AMONG PATIENTS WITH HUMAN IMMUNODEFICIENCY VIRUS (HIV) IN HOSPITAL TUANKU JAAFAR, SEREMBAN (HTJS), MALAYSIA

Christabel Esther Terence, Hatta Sidi*,
Koh Kwee Choy**, Raynuha Mahadevan**

**Department of Psychiatry, Universiti Kebangsaan Malaysia, 56000 Cheras, Kuala Lumpur, Malaysia; **Department of Psychiatry, Universiti Kebangsaan Malaysia, 56000 Cheras, Kuala Lumpur, Malaysia; **International Medical University, Clinical School, 70300 Seremban, Negeri Sembilan, Malaysia.*

Abstract

Objectives: This study aimed to determine the prevalence of depressive disorder and its association with perceived social support among patients with HIV attending the Infectious Disease Clinic in HTJS. **Methods:** A cross-sectional study was conducted, and systematic random sampling method was employed for the selection of participants. Socio-demographic and clinical details were obtained through a self-rated questionnaire and participants' medical records. Depressive disorder was screened and diagnosed using the Mini International Neuropsychiatric Interview (M.I.N.I.) and perceived social support was determined using the Multidimensional Scale of Perceived Social Support (MSPSS). Appropriate statistical analyses were used to determine the prevalence of depressive disorder and its association with perceived social support. **Results:** A total of 99 patients participated in this study. The mean age of participants was 38.16 ± 1.01 years, and the majority of participants were male (69.7%). Most of the participants were Malay (58.6%), followed by Indians (20.2%), Chinese (17.2%) and others (4.0%). The majority had completed secondary education (54%), and most were employed (79.8%). Most of the participants were single (45.5%) or married (45.5%). The lifetime and point prevalence of depressive disorder was 24.2% and 17.2%, respectively. About 64.7% of patients with depressive disorder were undiagnosed. Out of the 3 sources of perceived social support, perceived social support from a significant other (OR=0.53, p=0.042, CI=0.29, 0.98) and perceived social support from friends (OR=0.49, p=0.015, CI=0.27, 0.87) were found to be negative predictors for depressive disorder. **Conclusion:** This study reports that the prevalence disorder among patients with HIV in HTJS is higher than that of the general population. Patients without depressive disorder reported significantly higher perceived social support scores. Perceived social supports from significant others and friends were found to be important associated factors for lower depressive disorder vulnerability. Hence, physicians should routinely screen for depressive disorder in this vulnerable group and explore and mobilize their social support to reduce patients' vulnerability to develop depressive disorder. *ASEAN Journal of Psychiatry, Vol. 18 (1): January – June 2017: XX XX.*

Keywords: Prevalence, Depression, Perceived Support, Human Immunodeficiency Virus (HIV)

Introduction

HIV and its ensuing medical consequences, including the Acquired Immune Deficiency Syndrome (AIDS), continue to be a significant problem worldwide. Since its first reported case in Malaysia in 1986 [1], the numbers of people living with HIV have increased dramatically.

In 2015, there was a total of 36.7 million people living with HIV worldwide, of which 2.1 million were those with new infections [2]. In the same year, Malaysia had a total of 108,519 people living with HIV with 3,330 of those being new HIV infections [1].

People with HIV, due to better screening programmes and early detection and the advancement of treatment, are able to live relatively healthy lives. Despite this, they are still exposed to various stressors such as dealing with the initial diagnosis of HIV, concerns about long-term physical well-being and disruption in life goals, among many others [3]. Stigma, especially, poses a huge psychological burden on people with HIV leading to an array of negative consequences [4,5,6,7]. These stressors, naturally, place an increased risk for both medical and psychiatric co-morbidities.

Studies have consistently reported that people living with HIV have an increased risk of developing depressive disorders [8, 9, 10]. A meta-analysis of 10 studies involving over 2,500 people found that people living with HIV have a twofold increased risk of developing a major depressive disorder with a 9.4% prevalence compared to only 5.2% of the comparison participants [11]. Several studies in Malaysia have reported on the prevalence of depressive disorders in people living with HIV, and these range between 9.2% and 21% [12, 13,14].

Social support has been defined as a verbal and non-verbal communicative process that aims to improve people belonging, esteem, coping and competence [15]. It can be viewed in two distinctly different ways. Actual social support is the actual amount of social support the person has received and its benefits, and perceived social support, which is the person's

perception as to how much social support he or she has received and how it has benefited him or her [15].

Social support has been shown to buffer stress, improve psychological health of people [16] and protect against depressive disorder [17]. This has been studied in various populations, including adolescents [18] and the elderly. Similar studies have been conducted in people living with HIV [20, 21] but research into the local population of people living with HIV is still in need. Perceived social support has shown to positively benefit psychological well-being; however, actual social support appears to have a minimal effect [22].

The knowledge regarding the prevalence of depression, the presence of social support and the relationship between these two among people living with HIV is vital. These communities still face stigma and discrimination and many stressful life events. With such information, these important buffers against stressful events experienced by people living with HIV can be optimized, thereby enhancing protective factors against depressive disorders and lowering its prevalence. The aims of this study are to determine the prevalence of depressive disorder and its association with perceived social support in patients with HIV.

Methods

This was a cross-sectional study conducted on the registered HIV patients at the Infectious Disease Clinic in Hospital Tuanku Jaafar Seremban (HTJS), a tertiary health centre. The study was conducted from the 1st of July 2016 until the 31st of January 2017.

Ethical clearance was obtained from the Medical Ethics Research Committee, UKM and the Ministry of Health Medical Research Ethic Committee. The study was funded by the University Kebangsaan Malaysia Medical Centre (UKMMC).

We included patient diagnosed with HIV who had adequate knowledge of spoken or written forms of the Malay or English language and who agreed to participate in this study. Patients who were medically unstable and

those who had been moderate to severe intelligence disability, Organic Brain Syndrome or severe alteration of their mental state were excluded.

Study sample

In calculating the sample size, we considered the study by Ciesla JA et al. in 2001 [11] and used the single population formula, with finite population correction, better known as the Krejcie and Morgan formula as described below:

$$n' = \frac{NZ^2 P(1 - P)}{d^2(N - 1) + Z^2 P(1 - P)}$$

where

n' = sample size with finite population correction

N = Population size

Z = Z statistic for a level of confidence

P = Expected proportion, and

D = Precision

A systematic random sampling method was used to recruit ninety nine HIV patients in this study. An information sheet was provided, and informed consent was obtained from all participants.

Data collection

Using self-administered questionnaires, patient's socio-demographic details, which included their age, gender, ethnic group, education level, employment status and marital status were obtained. Additionally, duration since being diagnosed with HIV, the presences of personal history of depressive disorder prior to their HIV diagnosis and family history (first-degree) of depressive disorder were sought. The Multidimensional Scale of Perceived Social Support (MSPSS) and the Mini International Neuropsychiatric Interview (M.I.N.I.) were also used in this study.

Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS is a brief, the self-rated research tools designed to measure the perceptions of

support from 3 sources: family, friends and a significant other [23]. The definition for 'significant other' is not included in the original MSPSS and is, therefore, left to the participant's interpretation. MSPSS has been shown to have good internal and test-retest reliability as well as good validity across various studies. Its Malay version has good reliability and validity [24].

The MSPSS has 12 items divided equally to measure 3 different sub scales, each addressing the different source of support. Participants were asked to score each statement on a seven-point Likert-type scale (from very strongly disagree to very strongly agree). The average scores for each sub scale were then obtained.

Mini International Neuropsychiatric Interview (M.I.N.I.)

This brief clinician-administered structured interview is designed for the major axis 1 psychiatric disorders in Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) and International Statistical Classification of Diseases and Related Health Problems, 10th Edition (ICD-10). The section in relation to major depressive episode was used for this study to detect past and present major depressive episodes. The module used assessed the nine depressive symptoms along with the presence of functional impairment, similar to the diagnostic criteria adopted in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM 5).

Studies show that M.I.N.I has similar reliability and validity properties, but can be administered in a much shorter period of time, than other diagnostic tools such as the Structured Clinical Interview (SCID-P) [25] and the Composite International Diagnostic Interview (CIDI) [26]. The M.I.N.I. was used due to its ease of administration, quick administration time and relatively brief training needed before its use.

Statistical Analysis

For data analysis, all analyses were performed using the Statistical Package for Social Sciences (SPSS) Version 23. P-value of less

than 0.05 was considered as statistically significant at 95% confidence interval. During the analysis, as the data was found to be normally distributed, independent t – test was used to determine the differences between groups. The association between categorical variables and depressive disorder was tested using Chi square. The predictors of depressive disorder were determined using multivariate logistic regression analysis with the p-value of less than 0.05 at the level of significance.

Results

Socio-demographic distribution of study participants

A total of 99 patients who attended the Infectious Disease clinic at HTJS participated in this study. In terms of ethnicity, the majority of participants were Malay (58.6%), followed by Indian (20%), Chinese (17.2%) and others (4%). There were 69 (69.7%) male participants and 30 (30.3%) female participants. The mean age of participants was 38.16 (ranging from 20 to 63 years old).

As for the education level of the participants, the majority of them had completed their secondary level education (54%). Most of the participants were either single (45.5%) or married (45.5%) with the remaining being separated (3%), divorced (3%) or widowed

(3%). In terms of employment status, the majority of participants were employed (79.8%). The mean of years since being diagnosed with HIV was 5.85, with a range of 1 to 20 years. Only 2 (2%) participants had reported family history (first degree relative) of a depressive disorder and only 1 (1%) participant had been previously diagnosed with a depressive disorder by a medical professional.

Lifetime and point prevalence of depressive disorder

The lifetime and point prevalence of depressive disorder was 24.2% and 17.2% respectively. None of the participants had an episode of depressive disorder prior to being diagnosed with HIV.

Under diagnosed depressive disorder

Out of the 17 patients with current depressive disorder, only 3 had been referred to a psychiatric team for treatment and only 3 had been undergoing treatment at the psychiatric department. The remaining 64.7% remained underdiagnosed by the treating team in the Infectious Disease Clinic, HTJS.

The comparisons of socio-demographic variables between participants with and without current depressive disorder are summarized in Table 1.

Table 1. Comparison of demographic variables between study participants with and without current episode of depressive disorder

Variables	With depressive disorder (n, %)	Without depressive disorder (n, %)	p value
Gender Male Female	14 (20.3%) 3 (10.0%)	55 (79.7%) 27 (90.0%)	0.212
Ethnicity Malay Chinese Indian Others	12 (20.7%) 3 (7.6%) 1 (5.0%) 1 (25.0%)	46 (79.3%) 14 (82.4%) 19 (95.0%) 3 (75.0%)	0.430
Education level Nil Primary Secondary Tertiary	1 (100.0%) 6 (75.0%) 43 (79.6%) 32 (88.9%)	0 (0.0%) 2 (25.0%) 11 (20.4%) 4(11.1%)	0.600
Employment status Employed Unemployed	11 (13.9%) 6 (30.0%)	68 (86.1%) 14 (70.0%)	0.089
Marital status Single Married Seperated Divorced Widow/Widower	8 (17.8%) 6 (13.3%) 1 (33.3%) 1 (33.3%) 1 (33.3%)	37 (82.2%) 39 (86.7%) 2 (66.7%) 2 (66.7%) 2 (66.7%)	0.712

Perceived Social Support and Current Depressive Disorder

Comparison of the difference in perceived social support between participants with current depressive disorder and those without was done using independent t-test. There were significant differences between these groups in

total perceived social support ($t=5.20$, $p<0.001$, $CI=0.75, 1.67$) and in all sub scales of MSPSS(Table 2). These domains included perceived social support from significant others ($t=4.57$, $p<0.001$, $CI=0.84, 2.14$), family ($t=2.74$, $p=0.007$, $CI=0.23, 1.46$) and friends ($t=4.19$, $p<0.001$, $CI=0.68, 1.90$).

Table 2. Comparison of perceived social supportbetween study participants with and without current episode of depressive disorder

Variables	With depressive disorder (n=17) Mean ± SD	Without depressive disorder (n=82) Mean ± SD	t	p value	95% Confidence Internal
Perceived Social Support					
Significant Other	3.85 ± 1.70	5.34 ± 1.11	4.57	<0.001	0.84, 2.14
Family	4.41 ± 1.70	5.26 ± 1.02	2.74	0.007	0.23, 1.46
Friends	3.49 ± 1.19	4.77 ± 1.15	4.19	<0.001	0.68, 1.90
Total	3.92 ± 1.31	5.13 ± 0.76	5.20	<0.001	0.75, 1.67

Predictor of depressive disorder

Using simple logistic regression analysis, the predictors of depressive disorder in terms of total perceived social support and each of its domains were tested. The results (Table 3) showed that total perceived support (OR=0.24,

$p < 0.001$, CI=0.12, 0.50) was a negative predictor for depressive disorder. This was also true for its various domains, which included perceived support from significant others (OR=0.41, $p < 0.001$, CI=0.25, 0.67), family (OR=0.57, $p = 0.011$, CI=0.37, 0.88) and friends (OR=0.40, $p < 0.001$, CI=0.24, 0.67).

Table 3. Simple logistic regression analysis of perceived social support amongst participants with current depressive disorder

Perceived Social Support	B	S.E.	Wald	df	p	OR	95% Confidence Interval
Total	-1.40	0.36	14.78	1	<0.001	0.25	0.12,0.50
Significant Other	-0.89	0.25	12.78	1	<0.001	0.41	0.25,0.67
Family	-0.57	0.22	6.46	1	0.011	0.57	0.37,0.88
Friends	-0.91	0.26	12.24	1	<0.001	0.40	0.24,0.67

Using multivariate regression analysis, the negative predictors of depressive disorder were perceived social support from a

significant other (OR=0.53, $p = 0.042$, CI=0.29, 0.98) and perceived social support from friends (OR=0.49, $p = 0.015$, CI=0.27, 0.87).

Table 4. Multivariate regression analysis of perceived social support amongst participants with current depressive disorder

Perceived Social Support	B	S.E.	Wald	df	p	OR	CI
Significant Other	-0.63	0.31	4.16	1	0.042	0.53	0.29,0.98
Family	-0.09	0.32	0.09	1	0.770	0.91	0.49,1.71
Friends	-0.72	0.30	5.95	1	0.015	0.49	0.27,0.87

Discussion

The point prevalence of depressive disorder among patients with HIV in this study was 17.2%, in keeping with the prevalence sought through various other studies in Malaysia between the years 2010 and 2011 [12, 13]. More importantly, a previous study in 2010 among patients in HTJS found that 21.0% of patients who participated in the study suffered from depressive disorder [14]. This much higher prevalence of depressive disorder in comparison to the general population can be attributed to the various underlying biological and psychosocial aspects of having HIV. Biologically, in patients with HIV, markers of immune activation have been shown to predict depressive symptoms [27]. Additionally, there appeared to be higher degradation rates of tryptophan, a precursor to serotonin in patients with HIV

[27]. Psychologically, Psychologically, patients with HIV have to deal with the initial diagnosis of HIV, dealing with the stigma and discrimination, disclosing HIV to their significant others, family or friends, and making treatment decisions, among many others.

A total of 64.7% of participants who had depressive disorder in this study were under diagnosed. This is higher than the rates of undiagnosed depressive disorder in patients with HIV in other studies [28, 29]. Underdiagnosed and hence untreated depressive disorder is concerning especially in patients with HIV as it may lead to poor compliance to medications, including anti-retroviral therapy (ART) [30], decline in CD4 counts [31] and risky behaviour such as unprotected sex, thereby increasing risk of

HIV transmission [32]. Therefore, routine screening tools for depressive disorder should be routinely administered when treating patients with HIV.

In this study, lower scores of total perceived social support were found to be significantly associated with depressive disorder on both univariate and multivariate regression analysis. This is similar to a local study in Malaysia that looked into the association between perceived social support and depressive disorder among patients with breast cancer [33].

Notably, when multivariate regression analysis was used, it was the social support from significant others and friends who were found to be important associate factors with lower rates of depressive disorder. Other studies have reported similar findings whereby low perceived social support from significant others, friends or both are significantly associated with depressive disorder [34, 35].

A relationship with a significant other is usually described as a special confiding relationship with a certain depth [35]. Being able to confide in someone has been described to be a key in reducing a person's vulnerability for depressive disorder. Friends are other important sources of social support that should be enhanced offer an avenue to be included and accepted.

The implication of this study was that screening for depressive disorder should be carried out routinely in patients with HIV in view of their vulnerability for developing depressive disorder. In view of possible time constraint during consultation at the Infectious Disease Clinic, HTJS, a brief, self-rated screening tools such as the Patient Health Questionnaire-9 (PHQ-9) could be utilized during the patient waiting period. Additionally, physicians should explore and mobilize social support, specifically that from significant others and friends to buffer, stress and thus reduce the likelihood of a depressive disorder in these patients.

The strength of our study is that this is the first study conducted in Malaysia aimed to test the association between perceived social support and depressive disorder among patients with

HIV. Additionally, it offers a current prevalence of depressive disorder in this vulnerable group and highlights under diagnosis of depressive disorder in this group.

There are several limitations in this study. Firstly, the cross-sectional design of this study does not allow for any conclusions to be drawn regarding the cause and effect relationship of the associations. Secondly, the possible presence of recall bias in the instruments uses, notably the M.I.N.I. when assessing past the depressive episodes, pose another limitation to this study. Thirdly, the study was only carried out in one centre, thereby limiting its external validity. Therefore, the results from this study cannot be generalized to the general population. A multi-centre study could not be carried out due to time and budget constraints. Fourthly, patients with depressive disorder were possibly more likely to report poor social support in view of negative cognitive bias. However, it has been noted that it is perceived social support, irrespective of the reason of its discrepancy with actual social support, which show positive benefits to psychological well-being. Lastly, it is known that several diseases and medications could lead to depressive disorders. These elements were not tested during this study and may influence the results. It is recommended that further research on this area be conducted in Malaysia in the future.

Conclusion

This study reports a 17.2% prevalence of depressive disorder among patients with HIV in HTJS, higher than that of the general population. Patients without depressive disorder reported significantly higher scores of perceived social support from significant others, family and friends. Perceived social supports from significant others and friends were found to be important associated factors for lower depressive disorder rates. Hence, physicians should routinely screen for depressive disorders and explore social support from these sources as part of routine HIV care.

References

1. HIV/STI Section, Disease Control Division, Ministry of Health Malaysia. Global AIDS Response Progress Report, Malaysia 2016, http://www.unaids.org/sites/default/files/country/documents/MYS_narrative_report_2016.pdf (Accessed on 13th of January, 2017).
2. The Joint United Nations Programme on HIV/AIDS (UNAIDS). Global AIDS Update, 2016, http://www.unaids.org/sites/default/files/media_asset/global-AIDS-update-2016_en.pdf, (Accessed on 13th of January, 2017).
3. Martinez, J. et al., 'Stressors and Sources of Support: The Perceptions and Experiences of Newly Diagnosed Latino Youth Living with HIV', AIDS PATIENT CARE and STDS, vol. 26, no. 5, 2012, p. 281-290.
4. Katz, I.T. et al., 'Impact of HIV-related Stigma on Treatment Adherence: Systematic Review and Meta-synthesis', Journal of the International AIDS Society, vol. 16, 2013, supp. 2, 18640.
5. Sweeney, S.M., Mitzel, L.D. and Vanable, P.A. 'Impact of HIV-Related Stigma on Medication Adherence among Persons Living with HIV', Current Opinion in Psychology, vol. 5, 2015, pg. 96-100.
6. Takada, S. et al., 'The Dynamic Relationship Between Social Support and HIV-Related Stigma in Rural Uganda', Annals of Behavioral Medicine, vol. 48, no. 1, 2014, pg. 26-37.
7. Darlington, C.K. and Hutson, S.P. 'Understanding HIV-Related Stigma Among Women in the Southern United States: A Literature Review', AIDS and Behavior, vol. 21, no. 1, 2017, pg. 12-26.
8. Eller, L.S. et al., 'Depressive symptoms, self-esteem, HIV symptom management self-efficacy and self-compassion in people living with HIV. AIDS Care, vol. 26, no. 7, 2014, pg. 795-803.
9. Williams, A.B. et al., 'Efficacy of an evidence-based ARV adherence intervention in China', China Patient Care STDS, vol. 28, no. 8, 2014, pg. 411-417.
10. Talukdar, A. et al., 'Evaluation of depression and coping skills among HIV-positive people in Kolkata, India', Journal of the International Association of Physicians in AIDS Care, vol. 11, no. 2, 2012, pg. 115-120.
11. Jeffrey A. Ciesla, M.A. and John E. Roberts, Ph.D. Meta-Analysis of the Relationship Between HIV Infection and Risk for Depressive Disorders. Am J Psychiatry 2001; 158:725-730.
12. Hasanah, C.I, Zaliha, A.R. and Mahiran, M. 'Factors influencing the quality of life in patients with HIV in Malaysia'. Quality of Life Research, vol. 20, no. 1, 2011, pg. 91-100.
13. Zahari, M.M. et al., 'Psychiatric and substance abuse comorbidity among HIV seropositive and HIV seronegative prisoners in Malaysia', The American Journal of Drug and Alcohol Abuse, vol. 36, no. 1, 2010, pg. 31-38.
14. Shane, V. et al., 'Psychiatric morbidity among HIV patients in Hospital TuankuJaafar, Seremban, Malaysia. HIV/AIDS Prevention, Treatment and Care: The Way Forward. UniversitiSains Malaysia, Penang, AIDS Action & Research Group, 2010, pg. 85-101.
15. Matson, M. and Hall, J.G. Health as Communication Nexus: A Service Learning Approach, Kendall Hunt Publishing Company, 2011, Available

- on Research Gate (Accessed 13th January, 2017).
16. Ates, B. 'Perceived social support and assertiveness as a predictor of candidates psychological counselors' psychological well-being', *International Education Studies*, vol. 9, no. 5, 2016, pg. 28-39.
 17. Roohafza, H.R. et al., 'What's the role of perceived social support and coping styles in depression and anxiety', *Journal of Research in Medical Sciences*, vol. 19, no. 10, 2014, pg. 944-949.
 18. Brausch, A.M. and Decker, K.M. 'Self-esteem and social support as moderators of depression, body image, and disordered eating for suicidal ideation in adolescents', *Journal of Abnormal Child Psychology*, vol. 42, no. 5, 2014, pg. 779-789.
 19. Li, H., Ji, Y. and Chen T., 'The roles of different sources of social support on emotional well-being among Chinese elderly', *PLOS ONE*, vol. 9, no. 3, 2014, pg. 1-8, <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0090051&type=printable> (Accessed on 13th January, 2017).
 20. Zhang, J. et al., 'Social support and depression among people living with HIV in Yunnan Province, China', *International Information Institute (Tokyo)*, vol. 17, no. 4, 2014, pg. 1619-1626.
 21. Brittain, K. et al., 'Social support, stigma and antenatal depression among HIV-infected women in South Africa', *AIDS and Behavior*, vol. 21, no. 1, 2017, pg. 274, 282.
 22. MacDowell, T.L. and Serovich, J.M. 'The effect of perceived and actual social support on the mental health of HIV-positive patients', vol. 19, no. 10, 2007.
 23. Zimet, G.D. et al., 'The Multidimensional Scale of Perceived Social Support', *Journal of Personality Assessment*, vol. 52, 1998, pg. 30-41.
 24. Ng, C.G. et al., 'Validation of the Malay version of the Multidimensional Scale of Perceived Social Support (MSPSS-M) among a group of medical students in Faculty of Medicine, University Malaya', *Asian Journal of Psychiatry*, vol. 3, no. 1, 2010, pg. 3-6.
 25. Sheehan, D.V. et al., 'The validity of the Mini International Neuropsychiatric Interview (MINI) according to SCID-P and its reliability', *European Psychiatry*, vol. 12, no. 5, 1997, pg. 232-241.
 26. Lecrubier, Y. et al., 'The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI', *European Psychiatry*, vol. 12, no. 5, 1997, pg. 224-231.
 27. Schroecksnadel, K. et al., 'Quality of life and immune activation in patients with HIV-infection', *Brain Behaviour Immunity*, vol. 22, 2008, pg. 881-889.
 28. Rodkjaer, L. et al., 'Depression in patients with HIV is under-diagnosed: a cross-sectional study in Denmark', *HIV Medicine*, vol. 11, 2010, pg. 46-53.
 29. Asch, S.M. et al., 'Under-diagnosis of depression in HIV: who are we missing?', *Journal of General Internal Medicine*, vol. 18, 2003, 450-460.
 30. Gonzalez, J.S. et al., 'Depression and HIV/AIDS treatment non-adherence: a review and meta-analysis', *Journal of Acquired Immune Deficiency Syndromes*, vol. 58, no. 2, 2011, pg. 1-13.
 31. Ironson, G. et al., 'Psychosocial factors predict CD4 and viral load

- change in men and women with human immunodeficiency virus in the era of highly active antiretroviral treatment', *Psychosomatic Medicine*, vol. 67, 2005, pg. 1013-1021.
32. Kelly, J.A. et al., 'Factors associated with severity of depression and high-risk sexual behaviour among persons diagnosed with human immunodeficiency virus (HIV) infection', *Health Psychology*, vol. 12, no. 3, 1993, 215-219.
33. Ng, C.G. et al., 'Anxiety, depression, perceived social support and quality of life in Malaysian breast cancer patients: 1-year prospective study', *Health and Quality of Life Outcomes*, vol. 13, no.1, 2015, pg. 205-214.
34. Lancaster, C.A. et al., 'Risk factors for depressive symptoms during pregnancy: a systematic review', *American Journal of Obstetrics and Gynecology*, vol. 202, 2010, pg. 5-14.
35. Steward et al., 'Validation of the Multidimensional Scale of Perceived Social Support (MSPSS) and the relationship between social support, intimate partner violence and antenatal depression in Malawi', *BMC Psychiatry*, vol. 14, 2014, pg. 180-191.

Corresponding author: *Christabel Esther Terence, Medical Officer, Department of Psychiatry, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Cheras, 56000 Kuala Lumpur, Malaysia.*

Email: christabelterence@gmail.com

Received: 11 November 2016

Accepted: 5 March 2017