

The Prevalence and Risk Factors of Major Depressive Disorders in Gynaecological Cancer Patients

¹BC Tee, ²CK Phang*, ³A Rasidi, ⁴M Rushdan, ⁴I Aliyasand & ⁵S Hatta

¹Department of Psychiatry and Mental Health, Hospital Kulim, Kedah

²Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

³Department of Psychiatry and Mental Health, Hospital Sultanah Bahiyah, Alor Star

⁴Gynae-Oncology Unit, O&G Department, Hospital Sultanah Bahiyah, Alor Star

⁵Department of Psychiatry, Universiti Kebangsaan Malaysia Medical Centre

ABSTRACT

Major Depressive Disorder (MDD) in gynaecological cancer patients is a disabling illness with significant mental and physical suffering. Determining the risk factors of MDD in cancer patients enables us to pay more attention to those who are vulnerable and to devise effective strategies for prevention, early detection, and treatment. The objective of the study is to determine the prevalence of MDD and its associated risk factors in gynaecological cancer patients at Hospital Sultanah Bahiyah, Alor Star. This is a hospital-based cross-sectional descriptive study of 120 gynaecological cancer patients in Gynae-Oncology Unit in Hospital Sultanah Bahiyah, Alor Star. Mini International Neuropsychiatry Interview (MINI) was used for diagnosis of MDD. Socio-demographic data and clinical variables were collected. MVFSFI (Malay version Female Sexual Function Index) was used to determine sexual dysfunction, and WHOQOL-BREF (World Health Organization – Quality of Life-26) was performed to assess quality of life. The prevalence of MDD in gynaecological cancer patients in the study was 18%. The variables found to be significantly associated with MDD were lack of perceived social support, greater physical pain perception, presence of past psychiatric history, and poorer quality of life. Meanwhile, sexual dysfunction was not associated with MDD. Logistic regression analysis revealed that only the psychological health domain of QOL was significantly associated with MDD, and contributed to 60% of the variation in MDD. The prevalence of MDD in gynaecological cancer patients is higher than those in the general population. In view that MDD can compromise cancer prognosis and patient's well-being, psychosocial intervention is recommended as a part of multi-disciplinary and comprehensive management of gynaecological cancer.

Keywords: Major depressive disorder, gynaecological cancer, risk factors, stress, well-being

INTRODUCTION

According to the Planning and Development Division of the Ministry of Health Malaysia (2003), cancer is the second leading cause of death in Malaysia. Each year, it is estimated that approximately 30 000 new cases of cancer are being diagnosed^[1]. In Malaysia, the most common gynaecological cancer is cervical cancer, followed by ovarian cancer. The National Cancer Registry (2003) showed that over 1 500 women developed cervical cancer, and 700 died of it every year in Peninsular Malaysia. Yet, cervical cancer is also the most preventable cancer today. According to the same registry, ovarian cancer is the fourth most common cancer among women in Peninsular Malaysia, contributing to 5% of all female cancer cases^[1].

In Malaysia, the third National Health and Morbidity Survey (NHMS III 2006) reported that the overall estimated prevalence of recent psychiatric morbidity was 11.2%. However, among those with cancer and chronic pain, the psychiatric morbidity was much higher, with 67% and 64%, respectively^[2]. Worldwide, among patients with general cancer, 30%-60% of them had a psychiatric diagnosis dependent on the types of cancer, age group of the patients, countries and other factors^[3, 4, 5, 6, 7]. In a local study among 168 cancer patients undergoing chemotherapy, the prevalence of anxiety/depression (Hospital Anxiety & Depression Scale – HADS) was 32%^[8]. Cancer patients had 14 times increased risk of getting a psychiatric diagnosis^[6]. It was concluded that nearly 90% of the psychiatric disorders observed were either reactions to, or parts of disease and treatment manifestations^[4, 8]. There is a broad spectrum of emotional disturbance, ranging from normal reactive sadness to MDD^[9].

*Corresponding author: pckar39011@gmail.com

MDD is a medical illness characterized by persistent low mood, loss of interest and socio-occupational impairment. In overseas studies, the prevalence of MDD in gynaecological cancer was found to be between 12% - 23%^[4, 10, 12, 13]. The prevalence of MDD was influenced by multiple risk factors, ranging from patients' clinical, psycho-sexual and quality of life variables. Known risk factors are poor social support, low education level, low income, chemotherapy or radiotherapy and physical pain^[8, 9, 10, 11, 13]. When clinical depression is present, it may hamper treatment decision-making, impede recovery, and increase mortality^[11]. Depression in cancer patients can also affect their relationships with their loved ones, productivity at work place, quality of life, and lead to higher suicide rates^[14, 15, 16, 17].

The objective of this study was to determine the prevalence of MDD and its associated risk factors (socio-demographic, clinical, sexual dysfunction, and quality of life) in gynaecological cancer patients at Hospital Sultanah Bahiyah, Alor Star. It has implications on identifying those who are at risk of depression for psychosocial intervention. This study will contribute to a more comprehensive management of gynaecological cancer, thus, improving prognosis and quality of life in patient care.

MATERIALS AND METHODS

This is a hospital-based cross-sectional descriptive study of 120 gynaecological cancer patients in Gynae-Oncology Unit at Hospital Sultanah Bahiyah, Alor Star. A calculated sample size of around 109 patients was required to obtain a 95% CI of $\pm 5\%$ around a depression prevalence estimate of 20%. The sample comprised of patients diagnosed with gynaecological cancer and were receiving various outpatient and inpatient services (chemotherapy, radiotherapy, surgery) over a consecutive period of five months. Non-probability sampling method was used; the investigator travelled to the hospital for data collection twice a week. The eligibility criteria were of 18 years or older, able to communicate effectively and to give informed consent. Meanwhile, the exclusion criteria included patients with history of drug abuse and significant cognitive impairment, and those who refused to give consent and were unable to communicate. The study was approved by the Department of Psychiatry and Medical Research Ethical Committee of Universiti Kebangsaan Malaysia Medical Centre (UKMMC), and registered with the National Medical Research Registry (NMRR).

Subjects were interviewed using questionnaires that included socio-demographic variables (i.e., age, ethnicity, religion, religious practice, marital status, occupation, education level, husband's help in the household, presence of husband and children less than 18 years old at home, perceived social support), and clinical variables (i.e., type of cancer, duration of illness, staging, metastasis, recurrence, cancer treatment modalities, pain perception, medical illness and treatment, and history of psychiatric illness). Three other questionnaires used were: 1. Mini International Neuropsychiatry Interview (MINI), 2. Malay version of World Health Organization Quality of Life (WHOQOL-BREF), and 3. Malay Version Sexual Female Sexual Function Index (MVFSFI).

Mini International Neuropsychiatric Interview (MINI) was developed by Sheehan and Lecrubier^[18], and used for establishing the diagnosis of MDD in this study. It can be used by clinicians after a brief training session. In particular, MINI was designed to be a brief structured interview for Axis I diagnosis of major psychiatric disorders in Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), and International Classification of Disease (ICD-10). Some studies have been done to compare MINI with Structured Clinical Interview for DSM-III-R (SCID) and Composite International Interview (CIDI), and shown to have acceptable validity and reliability.

The Malay version of World Health Organization Quality of Life (WHOQOL-BREF) was used to determine quality of life. It is a 26-item self-report questionnaire that allows detailed assessment of each individual's aspects relating to quality of life: physical, psychological, social and environment^[19]. Higher scores indicate better quality of life. Internal consistency (Cronbach alphas, 0.66 – 0.84) and test-retest reliability (0.66 – 0.87) were found to be good for each of the four domains. Factor analysis confirmed the comparative fit of the four domain model of global quality of life. The Malay version of WHOQOL-BREF had been validated in the local population, and used previously in other studies^[20].

Meanwhile, the Malay Version Sexual Female Sexual Function Index (MVFSFI) was used to determine sexual dysfunction^[21]. In MVFSFI, the cut-off total score for sexual dysfunction was ≤ 55 and the cut-off score for each domain of sexual dysfunctions was as follows: ≤ 5 for the sexual desire disorder (sensitivity 95% and specificity 89%); ≤ 9 for sexual arousal disorder (sensitivity 77% and specificity 95%); ≤ 10 for disorder of lubrication (sensitivity 79% and specificity 87%); ≤ 4 for orgasmic disorder (sensitivity 83% and specificity 85%); ≤ 11 for sexual dissatisfaction (sensitivity 83% and specificity 85%); and ≤ 7 for sexual pain disorder (sensitivity 86% and specificity 95%).

All data were analyzed using the Statistical Package for Social Sciences (SPSS) version 11.5. Initially, associations between socio-demographic, clinical and other variables, and MDD were tested. For categorical data (e.g. gender), Chi-square test was used. Student T-Test was used to analyze normally distributed quantitative

variables (i.e., only age). As for not normally distributed quantitative variables (e.g., cancer duration), Mann-Whitney U test was used. Later, binary logistic regression test was used to analyze the association between those variables that were significantly associated with MDD. The level of statistical significance was set at $p < .05$. Post-hoc analysis using power analysis and sample size calculation software, "G*Power 3" (<http://www.psych.uni-duesseldorf.de/abteilungen/aap/gpower3/>)^[22], the power of the study for all the variables were at least 80% ($\alpha = 0.05$, medium effect size, two-tailed test), except for the variables 'age' and 'duration of cancer' (power > 80% only if effect size is large).

RESULTS

In this study, the age of the cancer patients ranged from 20 to 74 years old. The mean age was 50.60 years old (SD \pm 11.50 years). More than fourth-fifth of the subjects (99, 82%) were more than 40 years old. Other socio-demographic data of the patients are presented in Table 1.

Table 1. Socio-demographic data of gynaecological cancer patients

		Count (N =120)	Percentage (%)
Ethnic	Malay	75	63%
	Chinese	28	23%
	Indian	12	10%
	Others	5	4%
Religion	Islam	77	64%
	Buddhism	29	24%
	Christianity	5	4%
	Hinduism	9	8%
Religious practice	Frequent	95	79%
	Occasional	20	17%
	No	5	4%
Marital status	Married	83	69%
	Single	14	12%
	Divorced/Separated	7	6%
	Widowed	16	13%
Education level	No formal	13	11%
	Primary	31	26%
	Secondary	56	46%
	Tertiary	20	17%
Employment before cancer diagnosis	Employed	68	57%
	Unemployed	52	43%
Employment after cancer diagnosis	Employed	22	9%
	Unemployed	18%	82%
Perceived Social Support	Yes	94	78%
	No	26	22%

The prevalence of MDD in this study was 18% (21/120). However, the presence of MDD was only significantly associated with the lack of perceived social support ($\chi^2 = 5.31$, $p = .021$), presence of physical pain ($\chi^2 = 15.35$, $p < .001$), presence of past psychiatric history ($\chi^2 = 6.22$, $p = .013$), and poorer QOL, i.e. in physical health, psychological health, social relationships and environmental aspects ($p < .001$). Table 2, 3 and 4 summarize the prevalence of MDD and its associations with socio-demographic, clinical and other factors.

Table 2. MDD in gynaecological cancer patients in relation to socio-demographic factors

		Major Depressive Disorder (MDD) N = 120		χ^2	p value
		No	Yes		
Ethnic	Malay	62	13	0.41	.814
	Chinese	23	5		
	Indian	9	3		
Religion	Islam	64	13	2.65	.450
	Buddhism	24	5		
	Christianity	5	0		
	Hinduism	6	3		
Religious practice	Infrequent	20	5	0.14	.712
	Frequent	79	16		
Marital status	Married	66	17	1.66	.198
	Not married	33	4		
Education level	Low	61	15	0.72	.397
	High	38	6		
Quitting job after cancer diagnosis	Yes	34	12	3.18	.074
	No	21	1		
Perceived Social Support	Yes	12	82	5.31	.021*
	No	9	17		
Husband helps in household work	Yes	48	10	1.24	.265
	No	18	7		
Presence of young children at home	Yes	32	6	0.37	.545
	No	54	14		

Table 3. MDD in gynaecological cancer patients in relation to clinical factors

		Major Depressive Disorder (MDD) N = 120		χ^2	p value
		No	Yes		
Cancer diagnosis	Ovary	50	9	1.97	.741
	Endometrium	21	5		
	Cervix	26	6		
	Vagina	1	0		
	Vulva	1	1		
Stage of cancer	Early (1)	35	6	0.35	.552
	Advanced (2-4)	64	15		
Metastasis	Yes	25	6	0.10	.752
	No	74	15		
Recurrence	Yes	20	5	0.005	.941
	No	79	16		
Operation	Yes	84	20	0.84	.358
	No	15	1		

Continued

Table 3. Continued

		Major Depressive Disorder (MDD) N = 120		χ^2	<i>p</i> value	
		No	Yes			
Treatment modalities	Ongoing	Yes	45	10	0.03	.857
	Chemotherapy	No	54	11		
	Completed	Yes	40	6	1.03	.311
	Chemotherapy	No	59	15		
	Radiotherapy	Yes	26	4	0.48	.488
No		73	17			
Physical pain	Yes	45	20	15.35	< .001*	
	No	54	1			
Concurrent medical illness	Yes	50	11	0.02	.876	
	No	49	10			
Concurrent medical treatment	Yes	52	10	0.17	.683	
	No	47	11			
History of past psychiatric illness	Yes	7	6	6.21	.013	
	No	92	15			
Family history of psychiatric illness	Yes	11	2	0.00	1.000	
	No	88	9			
Overall sexual dysfunction	Yes	41	13	1.22	.268	
	No	25	4			
Other sexual dysfunction domains**	Yes	37 - 49	10 - 15	0 - 1.58	.21 - 1.0	
	No	17 - 25	2 - 7			

** Sexual desire, arousal, lubrication, orgasm, satisfaction, and pain

Table 4. MDD in gynaecological cancer patients in relation to quality of life

PQOL domain	Major Depressive Disorder (MDD)	Mean rank	Mann-Whitney U	<i>P</i> value
Physical health	Yes	27.17	339.5	< .001*
	No	67.57		
Psychological health	Yes	21.62	223.9	< .001*
	No	68.75		
Social relationship	Yes	39.43	597.0	< .001*
	No	64.97		
Environment	Yes	33.60	474.5	< .001*
	No	66.21		

Age, ethnic, religion, religious practice, marital status, education level, employment status, whether husband helps in the household, presence of children below 18 years old or less at home, types, staging and duration of cancer, treatment modalities, presence of metastasis and recurrence, presence of medical illness and treatment, family history of psychiatric illness, and overall sexual dysfunction were not associated with MDD ($p > 0.05$).

Logistic regression analysis of the significant variables (Table 5) showed that only the psychological health domain of QOL was significantly associated with MDD (OR = 0.90, 95% CI = 0.84 - 0.98). About 60% of the variation in MDD was likely to be explained by its relationship with the psychological aspects of quality of life.

Table 5. Logistic regression analysis of relationship between significant variables and MDD

Variable	Coefficient (β)	Standard Error	Wald χ^2	p value	Odds Ratio	95% CI
Perceived social support	0.23	0.95	0.06	.811	1.26	0.19 to 8.15
Presence of physical pain	2.15	1.20	3.20	.074	8.60	0.81 to 90.97
Past psychiatric history	1.34	0.97	1.91	.167	3.81	0.57 to 25.45
QOL - Physical health	-0.05	0.04	1.53	.217	0.96	0.89 to 1.03
QOL - Psychological health	-0.10	0.04	6.27	.012*	0.90	0.84 to 0.98
QOL – Social relationship	-0.01	0.03	0.15	.697	0.99	0.94 to 1.04
QOL – Environmental aspect	-0.08	0.05	1.99	.159	0.93	0.84 to 1.03

DISCUSSION

The prevalence of MDD disorder among the gynaecological cancer patients in this study was 18%. This is more or less similar with the results found in other studies on gynaecological cancer patients: 13%^[4], 12-23%^[13], and 23%^[23]. The slight difference in the prevalence is probably caused by the differences in the sample size, types of questionnaires used, treatment factors, and the settings, where the studies were carried out. Meanwhile, the prevalence rate is generally higher than those in the primary care (6.7-14.4%) and general community (8.3 - 13.9%) in Malaysia^[24]. In other words, about 1 in 5 of the patients had MDD, and that is excluding those with milder forms of depression (dysthymia and adjustment disorder with depressed mood). This is clinically very significant in view that MDD can negatively influence the course of physical illness. In a three-year follow-up study on gynaecological patients, it was noted that those with MDD had more visits to healthcare personnel and utilization of phone counselling services^[25]. Therefore, more psychosocial interventions, which have been shown to be useful^[26], are highly recommended in gynae-oncology units.

The perceived lack of social support was significantly associated with MDD. This finding is similar to the study on long-term gynaecological cancer survivors, whereby social support moderates the relationship between physical functioning and psychological outcomes^[27]. Nonetheless, all these are not surprising as humans are basically social beings who need social support for their growth and development. During challenging periods in life (e.g., battling with cancer), emotional and family supports are even more crucial for reducing depression and psychological distress [28]. Family members and friends can give information, companionship, comfort and sense of security to cancer patients. These are crucial factors for buffering emotional distress, as well as preventing and treating MDD. As parts of psychosocial intervention, regular sessions with family members are recommended as these can help to facilitate social support and minimize family conflicts (misunderstanding and disagreement on treatment options) related to patient care.

The association between greater physical pain perception and MDD is also not surprising and has been shown in many other studies^[3, 13]. Physical pain (either from cancer itself or the side effects of treatment) can precipitate and perpetuate MDD in cancer patients. On the other hand, depression can lower the threshold of physical pain perception and result in amplification of pain experience^[29]. In related to this, antidepressant treatment has been shown to reduce pain perception in cancer patients^[30]. Therefore, it is important for us to remember that pain has several inter-related dimensions (e.g., biological and psychosocial). Recognising physical pain is relatively easier as compared to emotional pain (e.g. MDD). Therefore, the routine use of short and simple depression questionnaire, e.g., Patient Health Questionnaire – PHQ 9 (available in English, Malay and Chinese) may be helpful in recognising and addressing psychological pain, which in turn helps in physical pain management.

The presence of past psychiatry history was found to be significantly associated with MDD, and this is also consistent with the finding of other studies^[3, 13]. Patients who had suffered from depression, anxiety or other psychiatric problems at any time in the past are at risk of relapsing under the stress of having cancer. To some degree, having MDD and cancer is like having a ‘double cancer.’ MDD is not just a disease of the mind/brain; it is a ‘systemic disease’ with psychosomatic consequence. Besides, it also often disrupts family and interpersonal harmony – MDD does recur like cancer and ‘metastasize,’ compromising physical and social well-being. Thus, extra attention should be given to this subgroup of patients with ‘double cancer.’

All domains of quality of life were shown to be significantly associated with MDD, and this is consistent with the study by Harrison *et al.*^[17]. This is expected as MDD is known to be a disabling illness that interferes with

quality of life. The observation was also confirmed by logistic regression analysis, whereby the psychological health component of QOL stood out as the only factor that was associated with MDD. However, the different domains of sexual dysfunctions and the overall sexual dysfunction were not associated with MDD. Maybe when a potentially life threatening cancer strikes the patients, they would be less preoccupied with the issue of sexual dysfunction. Hence, surviving through cancer became the top priority issue as compared to those related to sexuality. They could also be so depressed and in emotional pain that sexual problem was relatively insignificant.

It is also important to highlight that types, staging, duration, treatment modalities, presence of metastasis and recurrence of cancer were not associated with MDD. These observations are slightly different from some of those studies in existing literature. Some examples are given: 1. Women with breast and gynaecological cancer who received radiotherapy or chemotherapy (compared with surgery only), and had longer duration of cancer were more likely to maintain high anxiety and depressive symptoms over time^[31], and 2. Patients with cervical cancer radiation treatment regimes were more likely to have depression^[10]. However, a local study by Zainal also found that the primary site of cancer was not associated with psychological distress^[8]. The difference in these findings is probably contributed by the different research methodologies used and power of study.

This study has several limitations. First, non-probability sampling method was used, whereby data collection was done only on Mondays and Tuesdays (coincided with the follow-up clinics). Many new cases could have been missed as the new case clinics were on Thursdays. Second, the MINI diagnosis tool was not able to choose cases of adjustment disorder with depressed mood. Identifying this population is important as attention can be given to prevent them from progressing to having MDD. Third, recall bias could have affected information related to duration of cancer diagnosis, stage of cancer, treatment modalities, family history of psychiatric illness, etc. This can be overcome by checking clinical records and interviewing the carers or close family members. Fourth, the study did not include information on life events (non-cancer related), which is a plausible risk factor for depression. Finally, being a cross sectional study, only associative conclusions can be made, instead of causative ones.

CONCLUSION

The prevalence of Major Depressive Disorder (MDD) in gynaecological cancer patients at Hospital Sultanah Bahiyah, Alor Star was 18%. This figure is higher than those in the general population. The associated risk factors of MDD are lack of perceived social support, higher physical pain perception, presence of past psychiatric history, and poor quality of life. In view of the negative effects of MDD on cancer prognosis and patient's well-being, psychosocial intervention is highly recommended as a part of the multi-disciplinary and comprehensive management of gynaecological cancer.

ACKNOWLEDGEMENT

The authors would like to express their deepest gratitude to all the support from the Gynae-Oncology Unit, Department of Obstetrics and Gynaecology, Hospital Sultanah Bahiyah, Alor Star. The study is funded through a research grant from the National University of Malaysia.

REFERENCES

- [1] Lim GCC, Halimah Y. (Eds). Second Report of the National Cancer Registry. Cancer Incidence in Malaysia 2003. National Cancer Registry. Kuala Lumpur 2004.
- [2] The Third National Health & Morbidity Survey 2006 (NHMS III): Psychiatric Morbidity. Institute for Public Health, National Institutes of Health, Ministry of Health, Malaysia, 2008.
- [3] Atesci FC, Baltarli B, Oguzhanoglu NK, Karadag F, Ozdel O, Karagoz N. Psychiatric morbidity among cancer patients and awareness of illness. *Supportive Care in Cancer* 2004; 12(3): 161-167.
- [4] Derogatis LR, Morrow GR, Fetting. The prevalence of psychiatric disorders among cancer patients. *J Am Med Assoc.* 1983; 249: 751-757.
- [5] Minagawa H, Uchitomi Y, Yamawaki S, Ishitani K. Psychiatric morbidity in terminally ill cancer patients: A prospective study *Cancer.* 1996; 78(5): 1131-1137.

- [6] Sanyal D, Roy PS, Lahiri A, Ghosh M, Basu J. A Study of Psychiatric Morbidity amongst Cancer Patients. *International Medical Journal* 2003; 10(4): 289-294.
- [7] Singer S, Das-Munshi J, Brähler E. Prevalence of mental health conditions in cancer patients in acute care-a meta-analysis. *Annals of Oncology* 2009; 21(5): 925-930.
- [8] Zainal N, Hui K, Hang T, Bustam A. Prevalence of distress in cancer patients undergoing chemotherapy. *Asia-Pacific Journal of Clinical Oncology* 2007; 3(4): 219-23.
- [9] Pasquini M, Biondi M. Depression in cancer patients: a critical review. *Clinical Practice and Epidemiology in Mental Health* 2007; 3(1): 2.
- [10] Hengrasmee P, Padungsutt P, Boriboonthirunsarn D. Depression among gynecologic cancer patients at Siriraj Hospital: prevalence and associated factors. *J Med Assoc Thai* 2004; 87(3): S74-9.
- [11] Perdrizet-Chevallier C, Reich M, Lesur A. Depression and anxiety of women suffering from gynaecological cancers. *Dépression et anxiété chez les femmes souffrant de cancers gynécologiques* 2008; 166(4): 292-6.
- [12] Yeung WS. Psychiatric morbidity in cancer patients. *Hong Kong Practitioner* 1997; 19(8): 403-407.
- [13] Massie MJ. Prevalence of depression in patients with cancer. *Journal of National Cancer Institute Monographs* 2004; 32: 57-71.
- [14] Bolund C. Suicide and cancer: II. Medical and care factors in suicides by cancer patients in Sweden, 1973-1976. *J. Psychosoc Oncol.* 1985; 3: 31-52.
- [15] Bolund C. Suicide and cancer. I: demographical and suicidological description of suicides among cancer patients in Sweden. *J. Psychosoc Oncol.* 1985; 3: 17-30.
- [16] Conwell Y, Caine ED. Rational suicide and the right to die: reality and myth. *N. Engl J. Med.* 1991; 325: 1100-1113.
- [17] Harrison J, Maguire P. Predictors of psychiatric morbidity in cancer patients. *The British Journal of Psychiatry* 1994; 165(5): 593-598.
- [18] Sheehan DV, Lecrubier Y, Sheehan KH. The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structure diagnostic interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry* 1998; 59(suppl. 20): 20-33.
- [19] World Health Organization (WHO). WHOQOL Study Protocol. WHO (MNH7PSF/93.9) 1993.
- [20] Hasanah CI, Naing L, Rahman, ARA. World Health Organization Quality of life Assessment: Brief Version in Bahasa Malaysia. *Medical Journal of Malaysia* 2003; 58(1): 79-86.
- [21] Sidi H, Abdullah N, Midin M. The Female Sexual Function (FSFI): Validation of the Malay version. *J. Sex Med.* 2007; 4: 1642-1654.
- [22] Christopher AS, Nyaradzo HM. Statistical power, sampling, and effect sizes: three keys to research relevency. *Counseling Outcome Research and Evaluation* 2010; 1(2): 1-18.
- [23] Evans DL, McCartney CF, Nemeroff CB, Raft D, Quade D, Golden, RN. Depression in women treated for gynecological cancer: Clinical and neuroendocrine assessment. *American Journal of Psychiatry* 1986; 143(4): 447-52.
- [24] Mukhtar F, Oei TPS. A review on the prevalence of depression in Malaysia. *Current Psychiatry Reviews* 2011; 7(3): 1-5.

- [25] Malin M, Marie B, Inger B, Monica Å, Sundström P. Patients with psychiatric disorders in gynecologic practice—a three year follow-up. *Journal of Psychosomatic Obstetrics & Gynecology* 2006; 27(1): 17-22.
- [26] Meyer T, Mark M. Effect of psychosocial interventions with adult cancer patients: a meta-analysis of randomized experiments. *Health Psychology* 1995; 14(2): 101-8.
- [27] Carpenter KM, Fowler JM, Maxwell GL, Andersen BL. Direct and buffering effects of social support among gynecologic cancer survivors. *Ann Behav Med.* 2010; 39(1): 79-90.
- [28] Schaefer C, Coyne J, Lazarus R. The health related functions of social support. *Journal of Behavioral Medicine* 1981; 4: 381-406.
- [29] Spiegel D, Bloom, JR. Pain in metastatic breast cancer. *Cancer* 1983; 52(2): 341-5.
- [30] Mays T. Antidepressants in the management of cancer pain. *Current Science Inc.* 2001; 5(3): 227-36.
- [31] Schwarz R, Krauss O, Höckel M, Meyer A, Zenger M, Hinz A. The course of anxiety and depression in patients with breast cancer and gynaecological cancer. *Breast Care* 2008; 3(6): 417-22.

