

Clinical depression while caring for loved ones with breast cancer

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Abstract

Introduction: The period of the cancer patients undergoing treatment is also the most stressful time for their family caregivers. This study aimed to determine the rates of major depressive disorder and dysthymia; and their associated factors in the caregivers during this time.

Methods: One hundred and thirty caregiver–patient dyads attending the oncology centre for breast cancer treatment participated in this cross-sectional study. While the data on the patients' socio-demographic and illness characteristics were obtained from their medical record, the caregivers completed three self-report measures: 1) socio-demography and the caregiving factor questionnaire, 2) Multi-dimensional Perceived Social Support (MSPSS) and 3) Depression, Anxiety and Stress Scale (DASS-21). Subsequently, those with "probable depression" identified from the DASS-21 score were interviewed using The Mini-International Neuropsychiatric Interview (MINI) to obtain the diagnoses of depressive disorders.

Results: Twenty-three of the 130 caregivers (17.69%) were diagnosed to have depressive disorders, where 12.31% (n = 16) had major depressive disorder and 5.38% (n = 7) had dysthymic disorder. Factors associated with depression include ethnicity, duration of caregiving, the patients' functional status and the caregivers' education level. Logistic regression analysis showed that the patients' functional status (p < 0.05, OR = 0.23, CI = 0.06–0.86) and the caregivers' education level (p < 0.05, CI = 9.30, CI = 1.82–47.57) were significantly associated with depression in the caregivers attending to breast cancer patients on oncology treatment.

Conclusions: A significant proportion of family caregivers were clinically depressed while caring for their loved ones. Depression in this population is a complex interplay between the patients' factors and the caregivers' factors.

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1. Introduction

When a person is diagnosed with cancer, a gamut of emotions is anticipated to follow as one grieves. Most people need support from the families during this challenging period in the forms of physical help as well as psychosocially [1–3]. However, much work is needed in exploring the extent of severity of emotional burden cancer brings to the family caregivers.

A study by Bambauer [4] found that when patients met criteria for any psychiatric diagnosis, their caregivers were 7.9 times more likely to meet criteria for any psychiatric diagnosis. Similarly, when caregivers developed psychiatric illness, the patients under their care had significant risk of having a psychiatric illness. In a study on the caregivers of recurrent breast cancer patients, Northouse [1] found that the caregivers not only had significantly worse mental health than the general population but also experienced psychological distress far worse than the patients themselves.

The period of time when the cancer patients were undergoing treatment was identified as the most stressful stage of illness for the caregivers [5]. During this period, caregiving tasks may include managing the symptoms of the illness, treatment and its side effects, logistic and financial matter and other daily and household tasks as well as the patients' emotion, for a substantial period of time [6]. Of these tasks, Bakas [7] found that providing

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emotional support and monitoring illness symptoms are the most difficult.

The diagnosis of cancer in family impaired family functioning which in turn, was found to be significantly associated with depression and anxiety in both the patient and caregivers [8,9]. The added responsibility of caring for the ill family results in a shift in the caregiver's life. In addition, the family faced uncertain future as their loved ones suffered from a potentially fatal illness.

While many earlier studies identified high incidence of psychological distress [8,10,11], very few studies used diagnostic tools such as The Mini-International Neuropsychiatric Interview (MINI) and Structured Clinical Interview for the DSM-IV [12] to determine those that require more intensive psychiatric treatment. A few studies identified the psychiatric morbidity in general but did not specifically look at the factors associated with clinical depression in the caregivers [13,14].

In Malaysia, breast cancer is reported to be the most common cancer [15] whereby 1 in 20 women is estimated to suffer from it in their lifetimes [16–18]. Sadly, about half of the cases referred to Kuala Lumpur Hospital for oncologic treatment were reported to be at the later stages of 3 and 4 [19]. Treatment at later stage of illness may demand increased care and support from the caregivers and may increase their vulnerability to depression.

Therefore, this study aimed to determine the rates of depressive disorders in the caregivers during the treatment period of the breast cancer patients. It also examined the factors associated with depression to identify the sub-group of the caregivers who were at risk of depression.

2. Method

2.1. Study setting

The Institute of Radiotherapy and Oncology in Kuala Lumpur Hospital is a major referral centre for oncologic treatment in Malaysia where patients are referred from all over the country. It offers day-care and out-patient services as well as in-patient care. Patients are admitted either for active chemotherapy or radiotherapy treatment, or to receive palliative care. Patients may also be admitted for treatment complications such as lymphoedema and anemia.

2.2. Study design, operational definitions and sample

This is a cross-sectional study on the family caregivers of breast cancer patients who were undergoing oncology treatment either as inpatients or outpatients. Oncology treatment for breast cancer usually comprises of surgery followed by either chemotherapy or radiation therapy and subsequent maintenance therapy with hormonal drugs such as tamoxifen to prevent recurrences. The family caregivers referred to those who were related to the patients either by blood or by marriage, and were identified by the patients as

providing the majority of their unpaid, informal care [1,6,7]). When more than one caregiver was involved, the caregiver providing the most care was selected. The other inclusion criterion is that the caregivers must be able to understand and converse in English or Malay language. Caregivers who were not family members and/or less than 18 years old were excluded because of the relative infrequency of children and adolescents in primary care-giving roles. Moreover, caregiving experience of children and adolescents may differ from adults [13].

2.3. Study procedure

All breast cancer patients who came for treatment during the recruitment period and fulfilled the study inclusion criteria were invited and informed about the study. When the patient agreed to participate and identified the primary caregiver, the consent was obtained from both the patient and the caregiver. The data on the patients were limited to their socio-demography and illness characteristics which were obtained from the patients and their medical record. The caregivers were asked to complete three self-report measures i.e. their socio-demography and the caregiving factors, the Multi-dimensional Perceived Social Support (MSPSS) and Depression, Anxiety and Stress Scale (DASS-21) [20]. Subsequently, those with a score of DASS [20] that meets the cut-off point for stress, anxiety, or depression, which indicates the possibility of depressive disorders, were interviewed to obtain the diagnosis of depressive disorder using MINI.

All data were collected independently and confidentiality was assured.

2.4. Study measures

The patients' sociodemographic data and illness factors included age, gender, ethnicity, marital status, level of education, employment and monthly income, time since the diagnosis of cancer, stage of illness, type of treatment, frequency of treatment and the patients' functional scores using the Eastern Cooperative Oncology Group (ECOG) Performance Status scales, a reliable tool in assessing how cancer affects the patient's daily living abilities [21]. This scores from 0 to 5 whereby score 0 denotes a fully active person, score 1 denotes strenuous physical restriction but ambulatory and able to carry out work of a light or sedentary nature, score 2 denotes ambulatory and capable of all selfcare but unable to carry out any work activities, score 3 denotes limited selfcare capability whereby one is mostly confined to bed or chair, score 4 denotes complete disability and score 5 if one dies [21].

For the caregivers, their socio-demographic questionnaire included age, gender, ethnicity, marital status, educational level, employment status, monthly income, relationship with the patient and presence of medical illness. Data on the caregiving factors obtained included duration of caregiving (either less than 20 hours per week or more), number of

other dependent(s), proximity to the hospital (within Klang Valley area or outside of this area) and whether the main caregiving role is shared with other caregiver or not.

The caregiver's perceived social support is measured using The Multi-dimensional Perceived Social Support Scale (MSPSS) [22]. It is a 12-item self report questionnaire to measure perceived social support from three sources which are family, friends, and significant others. The caregivers will rate how strong they perceived others providing social support to them on a seven-point scale ranging from 'very strongly agree' to "very strongly disagree." It has excellent internal consistency with alphas of 0.91 for the total scale and good test–retest reliability as well. MSPSS has good factorial validity and has good concurrent validity when correlating with depression [22]. It has been translated by Ng and others in 2009 into the Malay language which has been validated [23] for the local use.

The main outcome measure of this study is the caregivers' depression. This was first identified using the Depression Anxiety Stress Scale (DASS-21) [20]. This is a 21-item self-report scale measuring symptoms of depression, anxiety and stress. The caregivers were asked to rate, on a 4-point scale, the extent to which they have experienced various symptoms over the past week, with '0' indicating the symptom 'did not apply' and '3' indicating the symptom 'applied very much or most of the time'. DASS 21 [20] item scores are derived from the completed DASS 42, summed and multiplied by two to derive scale scores. The DASS-21 has been translated into the Malay language. The internal consistency, test–retest reliability and validity of case-identification had been established for this translated version [24]. It is commonly used among the Malaysian population in clinics and in the community [25,26].

Subsequently, those who scored positive using DASS (i.e. met the cut-off point for stress, anxiety or depression) were interviewed to obtain diagnosis of a depressive disorder, using MINI [27]. MINI [27] is a brief structured interview for the major Axis I psychiatric disorders in DSM-IV and ICD-10. It has acceptably high validation and reliability scores whereby when compared to SCID-P, MINI [27] was found to be 96% sensitive and 88% specific while comparison with CIDI produced 94% sensitivity and 79% specificity.

Prior to this study, a pilot study was conducted on 20 caregivers who did not meet the cut-off point for stress, depression or anxiety and who were interviewed further with MINI [27]. It was found that none of the caregivers meet the criteria for any depressive disorders. It showed that DASS-21 [20] is reliable in screening for depression among the caregivers in this study's population.

2.5. Statistical analysis

Data were analyzed using the Statistical Package for Social Science (SPSS) version 18 (SPSS Inc., Chicagi, IL, USA). Bivariate analysis used Chi-square test with Yates' correction for the categorical data while continuous data

were analyzed using parametric (*t* test) for the normally distributed data, or non-parametric (Mann–Whitney U test) for data that were not normally distributed to see association of each variable with the outcomes. Multivariate Regression analyses were used to determine significant factors that are associated with psychological distress, depressive and anxiety disorders after controlling for the confounding effects.

2.6. Sample size

The estimated sample size of this study was about 150 caregiver–patient dyads based on the formula used to estimate a population proportion with specified absolute precision taken at 0.05% [28]. In this study, the expected proportion (prevalence) of depressive disorders was 11% based on the prevalence of psychiatric morbidity in the Malaysian population (The Third National Health and Morbidity Survey) [29].

2.7. Ethical aspects

This research project has received approval and permission from the Research and Ethics Committee, UKMMC and the Ministry of Health (MOH) Medical Research and Ethics Committee (MREC). Subjects who were identified to have depression were offered to be referred for psychiatric consultation while the confidentiality of the subjects was maintained.

3. Results

3.1. Study respondents

A total of 173 of the breast cancer patients were eligible to participate in this study during the recruitment period. However, a further 43 subjects (25% of total subjects approached) were excluded from this study due to absence of the caregivers ($n = 19$), refusal to participate ($n = 12$), caregivers were not the primary caregiver for the patient ($n = 6$), caregivers were not able to understand English or Malay language ($n = 5$) and the caregiver was not a family member ($n = 1$). The final respondents of breast cancer patients and their caregiver who participated in this study were 130.

3.2. Description of the participants' socio-demography, the patients' illness characteristics, the caregivers' burden of care and the caregivers' perceived social support

The mean age of the participating breast cancer patients was 52.48 ± 10.76 years while their caregivers' was about a decade younger i.e. 42.81 ± 14.48 years. For the patients, all but one patient were females while the caregivers comprised of more males (60.8%) than females (39.2%). The participants (both the patients and their caregivers) were overrepresented by Malays ($n = 94$, 72.3%) with the rest constituted of Chinese ($n = 27$, 20.8%) and Indians ($n = 9$,

6.9%) which reflected the ethnic distribution of Peninsular Malaysia. Majority of the breast cancer patients (87.7%) and their caregivers (65.4%) were married. Majority of the patients had primary (31.5%) or secondary education (47.7%), while only 13.1% had tertiary education and 7.7% had no formal education. Only 34 (26.2%) were working, while about two-thirds ($n = 85$, 65.4%) had no personal income.

With regard to illness severity, a third of the patients were in stage 4, another third in stage 2, while 10.8% in stage 1 and 22.3% in stage 3 with a mean duration of illness of 31.35 ± 39.71 months from the time of diagnosis. Regarding the types of treatment, 31.5% were undergoing chemotherapy, 14.6% were receiving radiotherapy, 10.8% were treated for palliative care and 43.1% were on hormonal therapy eg. tamoxifen. Functionality wise, 18.5% were fully active (score 0), 40.8% had restricted physically strenuous activity (score 1), 23.1% were ambulatory and capable of all selfcare but unable to carry out any work activities (score 2), 11.5% had limited selfcare and half of the time were confined to bed or chair (score 3) and 6.2% were completely disabled (score 4).

The caregivers constituted of 61 spouses (46.9%), 51 children (39.2%), 17 siblings (13.1%), and a parent (0.8%). Majority of them had secondary (59.2%) or tertiary education (29.2%) and were working (60.8%) and had personal income (77.7%). About two-thirds (65.4%) were caring for longer than 20 h and had other dependents (61.5%) with majority (69.2%) sharing the caregiving with other caregivers. Equal numbers of the participant caregivers live either within or outside Klang Valley.

3.3. Overall DASS results

In this study, a total of 64 caregivers (49.2%) of the 130 participants were found to have psychological distress i.e. they scored positively in either one or more domains of DASS-21 [20]. A total of 44 caregivers (33.9%) of the 130 participants were found to have probable depression: 18.5% ($n = 24$) scored positively in all the three scales of stress, anxiety and depression; 4.6% ($n = 6$) scored positively in both depression and anxiety domains; 2.3% ($n = 3$) scored positively in both depression and stress domains and 8.5% ($n = 11$) scored positively in depressive domain alone. Subjects who scored positively in either anxiety domain or stress domain alone constituted 15.4% ($n = 20$) of the subjects.

3.4. The rates of depressive disorders

For diagnosis of depression, all the 64 caregivers who were found to have scored positively in either one or more domains of DASS-21 [20] were further assessed with MINI [27]. 17.7% ($n = 23$) of the 130 participants was diagnosed to have depressive disorders, where 12.3% ($n = 16$) was diagnosed with major depressive disorder and 5.4% ($n = 7$) was diagnosed with dysthymia.

3.5. Factors associated with depressive disorders among caregivers

3.5.1. The patients' factors

Caregivers of Malay patients ($p = 0.02$, OR = 3.01, CI = 1.18–7.64), who in this study were invariably of Malay ethnicity as well and patients with higher ECOG scores i.e. worse functional status ($p = 0.036$, OR = 0.27, CI = 0.08–0.92), were found to be significantly associated with the caregiver's depressive disorders as shown in Table 1.

3.5.2. The caregivers' factors

Malay race (p -value < 0.05 , odds ratio = 3.01, CI = 1.18–7.64), lower education level (p -value < 0.05 , odds ratio = 5.32, CI = 1.18–23.98) and duration of caregiving > 20 h/week (p -value < 0.05 , odds ratio = 4.31, CI = 1.21–15.4) were found to be significantly associated with the caregiver's depression as shown in Table 2.

3.6. Logistic regression analysis in determining the association with depressive disorders among the caregivers

Logistic regression analysis for depressive disorders among the caregivers found that the patient's functional status and the caregiver's education were significantly associated with depressive disorders among the caregivers. The model explains 31.8% of the variance (Nagelkerke R Square = 0.318) in depressive disorders among the caregivers of breast cancer patients in this study. The caregivers of patients with low ECOG Performance Score, which means higher functionality were less likely to be depressed (odds ratio = 0.23, confidence interval = 0.059–0.856) while the caregivers who had lower than tertiary education (odds ratio = 9.30, confidence interval = 1.82–47.57) were more likely to develop depressive disorders. Table 3 summarizes the findings.

4. Discussion

This study aimed to identify depressive disorders and their associated factors in a sample of the family caregivers for breast cancer patients on various forms of treatment at a major referral center in Kuala Lumpur. Most studies reported the rate of depression in the caregivers based on self-rating scales assessments in the range between 20% and 50% [9,30,31]. Studies that used diagnostic tool for psychiatric diagnosis generally found a lower prevalence of depression such as Refs. [13] and [14] which reported rates of 4.5% and 9.7% respectively, both reporting for Major depressive disorder [13] only. We found that the rates of major depressive disorder and dysthymia in this study were 12.3% and 5.4% respectively; higher than the previous studies conducted in the West [13,14].

In this study, we found the rate of "probable depression" was 33.9%, suggesting a high proportion of 'caseness' among the family caregivers. This may be explained by the range of emotional distress that is commonly experienced by

Table 1

Association between caregiver's depressive disorder and the socio-demographic as well as illness characteristics of the breast cancer patients (n = 130).

Variable	Depressed (n = 23)	Non-depressed (n = 107)	Test	p value
Age (years)	23 (49.39 ± 10.93)	107 (53.15 ± 10.66)	1.53 ^a	0.13
Race				
Malay	12 (9.23%)	82 (63.08%)	5.66 ^b	0.02
Non-Malay	11 (8.46%)	25 (19.23%)		
Marital status				
Married	20 (15.38%)	95 (73.08%)	0.06 ^b	0.52
Not married	3 (2.31%)	12 (9.23%)		
Education				
Non-tertiary	21 (16.15%)	92 (70.77%)	0.47 ^b	0.39
Tertiary	2 (1.54%)	15 (11.54%)		
Occupation				
Employed	5 (3.85%)	29 (22.31%)	0.28 ^b	0.40
Unemployed	18 (13.85%)	78 (60.00%)		
Income				
No income	17 (13.08%)	68 (52.31%)	0.90 ^b	0.64
<RM2000 monthly	4 (3.08%)	26 (20.00%)		
>RM2000 monthly	2 (1.54%)	13 (10.00%)		
Cancer severity				
Mild (Stage 1)	1 (0.77%)	13 (10.00%)	5.72 ^b	0.06
Moderate (Stage 2 and 3)	9 (6.92%)	61 (46.92%)		
Severe (Stage 4)	13 (10.00%)	33 (25.38%)		
Treatment type				
Active (Chemotherapy, Radiotherapy, Palliative)	16 (12.31%)	58 (44.62%)	1.82 ^b	0.13
Outpatient (Hormonal therapy)	7 (5.38%)	49 (37.69%)		
Illness duration (month)	23 (28.21 ± 35.89)	107 (32 ± 40.58)	0.42 ^a	0.16
Treatment duration				
Daily to 3-weekly	17 (13.08%)	59 (45.38%)	4.01 ^b	0.12
2 to 4-monthly	5 (3.85%)	26 (20.00%)		
> 4-monthly	1 (0.77%)	22 (16.92%)		
ECOG score				
0–1	6 (4.62%)	71 (54.62%)	19.63 ^b	0.04
2	6 (4.62%)	24 (18.46%)		
3–4	11 (8.46%)	12 (9.23%)		

^a t-test.^b Pearson's Chi-square test.

the grieving family caregivers. This highlights the importance of facilitating this process as a preventive measure to ensure the risk of progress to clinical depression is minimized. This finding also recognized the period of cancer patients undergoing treatment as a high risk period of depression.

Bivariate analysis of the factors associated with depression showed ethnicity, duration of caregiving, the patients' functional status and the caregivers' education level to be significant. However, after controlling for the confounding variables, only the latter two remain significant. The role of socioculture in caregiving may be examined in a multiracial community like Malaysia. However, this was not demonstrated in this study. Siefert [32] also found that ethnicity does not affect the outcome measures in a racially diverse sample of cancer family caregivers when controlling for other demographics factors.

This study found that providing care for more than 20 hours a week was significantly associated with depression among the caregivers. Longer duration of caregiving may compromise the caregivers' time for themselves that could lead to emotional distress. Osse [33] found that almost 50% of

caregivers of cancer patients expressed problems in finding activities for them to relax and in continuing the things they want to do for others. Longer duration of caregiving may also be translated into significant financial impact, associated with increased loss in the work hours [34,35], greater cost of medications, special diets and special equipments.

However, in this study, this factor lost its significance when controlling for other confounders. Longer caregiving duration may reflect poorer functional status and greater illness severity of the patients. Patients who were bedridden required more time to be spent on caring for them including to the point of assisting with their ADLs. In this study, we found that caregivers who were taking care of patients with higher functional status were less likely to have depression ($p < 0.05$, OR = 0.23, CI = 0.059–0.856). This finding is consistent with previous study findings which found that caregivers of patients with limited ADL functions experienced greater distress and constraints in their own schedules [36,37]. Patients with lower functional abilities would also require more physical assistance which may lead to fatigue, a symptom commonly reported by distressed caregivers

Table 2

Association between caregiver's depressive disorder and the caregiver's socio-demographic, caregiving factors, and perceived social support (n = 130).

Variable	Depressed	Non-depressed	Test	p value
Age (years)	23 (38.39 ± 13.46)	107(43.75 ± 14.58)	1.62 ^a	0.12
Sex				
Male	14 (10.77%)	65 (50.00%)	0.00 ^b	0.59
Female	9 (6.92%)	42 (32.31%)		
Race				
Malay	12 (9.23%)	82 (63.08%)	5.66 ^b	0.02
Non- Malay	11 (8.46%)	25 (19.23%)		
Marital status				
Married	12 (9.23%)	73 (56.15%)	2.16 ^b	0.11
Not married	11 (8.46%)	34 (26.15%)		
Education				
Non-tertiary	21 (16.15%)	71 (54.62%)	5.70 ^b	0.01
Tertiary	2 (1.54%)	36 (27.69%)		
Occupation				
Employed	14 (10.77%)	66 (50.77%)	0.01 ^b	0.56
Unemployed	9 (6.92%)	41 (31.54%)		
Income				
No income	7 (5.38%)	22 (16.92%)	2.07 ^b	0.36
<RM2000 monthly	10 (7.69%)	41 (31.54%)		
>RM2000 monthly	6 (4.62%)	44 (33.85%)		
Relationship to patient				
Spouse	10 (7.69%)	51 (39.23%)	0.13 ^b	0.45
Children	10 (7.69%)	42 (32.31%)		
Others	3 (2.31%)	14 (10.77%)		
Medical illness				
Absent	15 (11.54%)	72 (55.38%)	0.04 ^b	0.51
Present	8(6.15%)	35 (26.92%)		
Duration of caregiving				
>20 h/week	20 (15.38%)	65 (50.00%)	5.75 ^b	0.01
<20 h/week	3 (2.31%)	42 (32.31%)		
Dependants				
No other dependant	9 (6.92%)	41 (31.54%)	0.01 ^b	0.56
Other dependant	14 (10.77%)	66 (50.77%)		
Proximity to hospital				
Outside Klang Valley	12 (9.23%)	53 (40.77%)	0.05 ^b	0.50
Within Klang Valley	11 (8.46%)	54 (41.54%)		
Shared caregiving				
No	9 (6.92%)	31 (23.85%)	0.92 ^b	0.24
Yes	14 (10.77%)	76 (58.46%)		
Perceived social support (mean rank)				
Significant others	23 (58.91)	107 (66.92)	-0.97 ^c	0.35
Family	23 (53.35)	107 (68.11)	-1.72 ^c	0.09
Friends	23 (65.24)	107 (65.56)	-0.04 ^c	0.97

^a t-test.^b Pearson's Chi-square test.^c Mann-Whitney U.

Table 3

Logistic regression analysis of independent variables on depressive disorders.

Variables	B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
Patient's ECOG scores	-1.49	.68	4.79	1	.029	.23	.059	.86
Caregiver's education	2.23	.83	7.18	1	.07	9.30	1.82	47.57

[33,37]. Lower functional abilities of the patients may also be an indicator that their cancer is at an advanced stage hence the caregivers could be emotionally affected by the impending loss of their loved one. Anticipatory grief would have increased the chances of the caregivers to develop depressive disorders.

One factor that has been consistently associated with depression in the caregivers is their education level [13,38,39]. This study also found that caregivers with secondary education and below were 9.3 times more likely to develop depression compared to those with tertiary education.

Education may improve a person's psychological well-being in many ways. It increases the sense of control over one's own life while lack of it may lead to poor understanding of the complexities of cancer and its treatment thus increasing one's uncertainty and fear [40]. Education also affects one's coping style during difficult times which may not be as efficient and versatile [40]. Vanderwerker [13] found that caregivers with tertiary education are more likely to seek help for mental health concern. Low education is also associated with low income; another factor that may add stress to the caregiver is if one also had to provide the financial means for treatment and related costs. Low education in the caregiver could also contribute to late presentation of the patient for treatment, which in itself leads to even more stressful outcomes related to its negative effect on patients' treatment, symptoms, functionality and life expectancy.

We expected factors like the patient's illness severity, treatment duration and perceived social support to be among other factors that may be associated with depression among the caregivers, but these were not found to be significant in this study. For example, majority of the studies found that perception of social support was an important determinant of psychological distress (check) in the caregiver [41,42].

5. Limitations

In this study, there is an over presentation of the Malay race (which is the largest ethnicity in Malaysia), and caregivers who were married, unemployed and had low education level which accounted for 70% to 80% of the sample. Another sampling bias in this study was that it was conducted in one clinical setting which may not represent the larger population, particularly with regard to the private-owned oncology centres. This study also did not explore other important variables particularly the caregivers' coping styles [43], optimism [44] and mastery [45]. These factors could have been significant confounders which if included, may improve some of the results in the study.

6. Conclusions

Depression is a complex illness that involves interaction of various intrinsic and extrinsic factors. Caregiving factors alone do not account for depression but may interact with the vulnerability factors of the caregivers. This study found that the caregivers at risk of clinical depression are those who had to care for a long duration and were from a lower educational level. This finding gives clues to intervening depression among the caregivers by providing support in the form of respite care to the caregivers [46] and improving engagement of the caregivers by the health care providers. The results should increase the health care providers' awareness of the

vulnerability of this population and discard a patient-centric approach of treatment.

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