Factors that Influence the Incidence of Depression in Breast Cancer Patients

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Abstract

The prevalence of psychological distress in breast cancer patients is high, and they are at higher risk of experiencing severe anxiety, depression, and potential mood disorders. Depression that occurs in breast cancer patients is influenced by several factors. This study aims to determine the factors that influence the incidence of depression in breast cancer patients. The population of this study were all breast cancer patients in the outpatient clinic for oncology surgery and inpatient building A Zone A 2nd floor at Dr. Cipto Mangunkusumo General Hospital Jakarta, the sample in this study was 102 respondents. The research design used in this study was cross-sectional. The measuring instrument used to measure the incidence of depression is to use depression screening tools in accordance with those used at Dr. Cipto Mangunkusumo General Hospital Jakarta. Items assessing socio-demography, physical symptom burden, social support, and medical and medication history, with complementary medical record reviews, were used to assess variables potentially associated with depressive symptoms. Logistic regression was used to identify associated factors. The incidence of depression in breast cancer patients was dominated by the group of respondents who did not experience depression as many as 57 people (55.9%), compared to the group of respondents who experienced depression as many as 45 people (44.1%). The results of the logistic regression showed that there was only family support variable which had a $p = 0.002 < 0.005$, meaning that family support was the most influential variable on the incidence of depression in breast cancer patients. It is recommended to reduce the incidence of depression, namely nurses should facilitate adequate family support for breast cancer patients to reduce the incidence of depression.

Introduction

The incidence of cancer is increasing from year to year and occurs almost all over the world. Cancer is the second largest disease in the world. Data on the number of cancer sufferers worldwide reaches 14 million cases with a mortality rate of 8.2 million annually [1]. The prevalence of cancer in Indonesia is quite high based on the data 2018 Basic Health Research (RISKESDAS) report that breast cancer ranks 7th of all cancers. Data presented by the Directorate Non-Communicable Diseases, Directorate General of Prevention and Disease Control Ministry of Health of the Republic of Indonesia (2019) reveals that the highest incidence rate for women is breast cancer, namely, 1.4 per 1000 population in 2013 increasing to 1.79 per 1000 population in 2018 [2].

The prevalence of depression is high during the 1st year after breast cancer diagnosis, and according to a systematic review by Zainal et al. [3], the three studies with the highest prevalence of depression included patients in the 1st year after diagnosis [4], in addition, sociodemographic factors, such as age, marital status, occupation, education, socioeconomic status, lack of family support, stress, anxiety, and

impaired self-concept, can also increase the incidence of depression in breast cancer patients [5].

One study showed in a very large sample of cancer patients that the prevalence of depression among breast cancer survivors was approximately 32.8%. It has also been reported that 40% of patients who experience disease relapse will suffer from anxiety and depression. In 227 advanced breast cancers, Grabsch et al. found 42% rates of psychiatric disorders and 35.7% of them had depression or anxiety or both. Mild depression was found in 25.6%, major depression in 7%, and anxiety disorders in 6.2% [6].

Risk factors for depression in breast cancer patients include: History of anxiety or depressive disorder, younger age at diagnosis, poor social support, aggravating somatic symptoms, being on active cancer treatment, certain drug treatments, worries about fear of death and disease recurrence, changes in body image, changes in femininity, sexuality, and attractiveness [7]. Adjuvant chemotherapy can lead to an increased risk of depression, anxiety, or both during but not after treatment [8].

Based on the results of a preliminary study at RSUPN Dr. Cipto Mangunkusumo Jakarta, there are 11,792 patients with breast cancer (RSCM Medical

Record, 2019). Based on the results of interviews with 5 breast cancer patients at the oncology surgery outpatient clinic, Dr. Cipto Mangunkusumo General Hospital Jakarta, as many as three people are depressed and two people are not depressed. This study has a research question, "What factors influence the incidence of depression in breast cancer patients and from these factors, which factors most influence the incidence of depression in breast cancer patients at Dr. Cipto Mangunkusumo Jakarta?" This study aims to determine the factors that influence the incidence of depression in breast cancer patients.

Methods

This type of research design used is a non-experimental quantitative research using a cross sectional approach. The population of this study were all women suffering from breast cancer at the outpatient clinic for oncology surgery and the inpatient unit A Zone A 2nd floor at Dr. Cipto Mangunkusumo General Hospital Jakarta. The ethical principles applied in this study have been approved and declared to have passed the ethical test obtained from the Nursing Research Ethics Committee, Faculty of Nursing, University of Indonesia.

Based on the multivariate logistic regression formula, the number of samples taken in this study was 102 respondents, in the oncology surgery outpatient clinic as many as 65 respondents, while in the inpatient building A Zone A 2nd floor as many as 37 respondents. The sampling technique used in this research is the non-probability sampling method, which is convenient sampling. The inclusion criteria of respondents in this study are: Women with breast cancer who are currently undergoing therapy, women who have been diagnosed with breast cancer, can communicate in Indonesian well, can read and write, and are willing to be respondents. This research was conducted at the Polyclinic and Inpatient Dr. RSUPN. Cipto Mangunkusumo Jakarta, data collection was carried out for ±2 weeks at the oncology surgery outpatient poly and inpatient building A Zone A 2nd floor at Dr. Cipto Mangunkusumo General Hospital Jakarta.

The measuring instrument used to measure the incidence of depression is to use depression screening tools in accordance with those used at Dr. Cipto Mangunkusumo General Hospital Jakarta to determine the incidence of depression in both psychiatric and non-psychiatric patients, besides that this depression screening tool has also been used in breast cancer patients and has been published previously, so this depression tool is only to measure the incidence of depression in patients. The depression instrument consists of ten question items.

Anxiety measuring instrument used to determine the level of anxiety of breast cancer patients is STAI (State Anxiety Inventory) according to Spielberger's, this test consists of 16 statement items about anxiety. The self-esteem measurement tool using Rosenberg's Self Esteem Scale consists of ten statement items. The Perceived Stress Scale (PSS) is the most widely used psychological instrument to measure stress perception with ten statement items. Demographic data were collected using a short questionnaire at the patient's first interview including age, education, spouse ownership, and occupation.

The results of the reliability test showed that the measuring instrument for all variables in this study was reliable with Cronbach's alpha coefficient, for the depression incidence questionnaire was 0.950 (reliable), self-esteem was 0.933 (reliable), anxiety was 0.981 (reliable), stress was 0.986 (reliable), and family support of 0.971 (reliable).

Data were analyzed using SPSS version 22.0. Statistical tests were performed with univariate, bivariate, and multivariable analysis. Univariate analysis using descriptive statistics, bivariate analysis using Chi-square, and multivariate analysis using logistic regression. The modeling chosen in this study is to use Backward modeling, namely, by selecting variables that are considered important to be included in the model, by maintaining variables that have $p < 0.05$ and removing variables with a $p > 0.05$, but it is done manually. Gradually starting from the variable has the largest p value. Statistical analysis was performed in SPSS 22.0.

Results

The incidence of depression in breast cancer patients was dominated by the group of respondents who did not experience depression as many as 57 people (55.9%), compared to the group of respondents who experienced depression as many as 45 people (44.1%) (Table 1).

Table 1: Distribution frequency of depression in breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta (*n* = 102)

Depression	Frequency (%)
No depression	57 (55.9)
Depression	45 (44.1)

The effect between age and the incidence of depression in breast cancer patients is 90 people who are included in the adult age category (20 - 59 years), there are 40 people (44.4%) who experience depression. This means that the proportion of depression in patients in the adult age group (20 - 59 years) tends to be greater than in other age categories (Table 2). The results of statistical tests obtained p = 0.584, it can be concluded

that statistically there is no significant effect between age on the incidence of depression in breast cancer patients.

Table 2: Distribution frequency of respondents' characteristics (age, education, spouse ownership, and occupation) in breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta (*n* = 102)

Variabel independent	*n* (%)
Age	
Adult = 20–59 years old	90 (88.2)
Elderly = >59 years old	12 (11.2)
Level of education	
Low = elementary–junior high	53 (52.0)
Height = SMA–PT	49 (48.0)
Marital status	
Don't have a partner	37 (36.3)
Have a partner	65 (63.7)
Employment	
Does not work	84 (82.4)
Work	18 (17.6)

The effect of education level with the incidence of depression in breast cancer patients is that from 53 people with low education (SD-SMP), there are 22 people (41.5%) who experience depression. This means that the proportion of depression in patients with low education (SD-SMP) tends to be higher than in patients with higher education levels (SMA-PT). The results of statistical tests obtained p value = 0.581, it can be concluded that statistically there is no significant effect between the level of education on the incidence of depression in breast cancer patients.

Table 3: Distribution frequency of self-esteem, anxiety, stress, and family support for breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta (*n* = 102)

Independent variable	Frequency (%)
Self esteem	
Negatif	67 (65.7)
Positif	35 (34.3)
Anxiety	
No anxiety	40 (39.2)
Anxiety	62 (60.8)
Stress	
No stress	55 (53.9)
Stress	47 (46.1)
Family support	
Lack of support	25 (24.5)
Good support	77 (75.5)

The effect of spouse ownership on the incidence of depression in breast cancer patients is that from 65 people who have a partner, there are 28 people (43.1%) who experience depression. This means that the proportion of depression in patients who have partners tends to be higher than respondents who do not have partners. The results of statistical tests obtained p value = 0.779, it can be concluded that statistically there is no significant effect between marital status on the incidence of depression in breast cancer patients.

The effect of work with the incidence of depression in breast cancer patients is from 84 people who do not work, there are 35 people (41.7%) who are depressed. This means that the proportion of depression in patients who do not work tends to be higher than those who work. The results of statistical tests obtained p value = 0.281, it can be concluded that statistically there is no significant effect between work status on the incidence of depression in breast cancer patients.

Table 4: Logistics regression test results effect of self-esteem, anxiety, stress, and family support with depression incidence in breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta (*n* = 102)

Step	Variable	Significance	Exp (B)
Step 1	Self esteem	0.120	2.068
	Stress	0.055	2.378
	Anxiety	0.061	2.368
	Family support	0.005	0.219
	Constant	0.431	0.299
Step 2	Stress	0.053	2.360
	Anxiety	0.057	2.387
	Family support	0.004	0.216
	Constant	0.876	0.806
Step 3	Stress	0.062	2.244
	Family support	0.002	0.193
	Constant	0.171	4.304
Step 4	Family support	0.002	0.210
	Constant	0.007	12.245

The effect of self-esteem with the incidence of depression in breast cancer patients is that most of the respondents in this study had negative self-esteem, that of 67 people with negative self-esteem, there were 25 people (37.3%) who experienced depression. This means that the proportion of depression in patients who have negative self-esteem tends to be higher than patients who have positive self-esteem. The results of statistical tests obtained p = 0.056, it can be concluded that statistically there is no significant effect between the variables of self-esteem on the incidence of depression. From the results of the analysis, the value of OR =2.240 with (95% CI: 0.974-5.151), meaning that respondents who have negative self-esteem have a 2.24 times chance of experiencing depression compared to respondents who have positive self-esteem, with a 95% confidence level in range from 0.974 to 5.151.

The effect of anxiety with the incidence of depression in breast cancer patients is that most of the respondents in this study experienced anxiety, that of the 62 people who experienced anxiety, 33 people (53.2%) experienced depression. This means that the proportion of depression in anxious patients tends to be higher than in non-anxious patients. The results of statistical tests obtained p value = 0.021, it can be concluded that there is a statistically significant effect between the anxiety variables on the incidence of depression. From the results of the analysis, the value of OR =2.655 (95% CI: 1.146–6.153), meaning that respondents who experience anxiety have 2.655 times the opportunity to experience depression compared to respondents who do not experience anxiety, with a 95% confidence level in the range between 1.146 and 6.153.

The influence between stress and the incidence of depression in breast cancer patients is that most of the respondents in this study experienced stress, so that of the 47 people who experienced stress, there were 25 people (53.2%) who experienced depression. This means that the proportion of depression in stressed

patients tends to be higher than in non-stressed patients. The results of statistical tests obtained p value = 0.088, it can be concluded that statistically there is no significant effect between the stress variables on the incidence of depression. From the results of the analysis, the value of OR =1.989 (95% CI: 0.899–4.398), meaning that respondents who experience stress have a 1.98 times chance to experience depression compared to respondents who do not experience stress (Table 3).

The influence between family support and the incidence of depression in breast cancer patients is that most of the respondents in this study had good family support, so that of the 77 people with good support, there were 27 people (35.1%) who experienced depression, compared to respondents who had good support. lack of family support, that from 25 people who have less family support, there are 18 people (72.0%) who experience depression. This means that the proportion of depression in breast cancer patients who have less family support tends to be higher than patients with good family support. The results of statistical tests obtained p value = 0.001, it can be concluded that statistically there is a significant effect between the variables of family support on the incidence of depression. From the results of the analysis, the value of OR =0.210 (95% CI: 0.078–0.566), meaning that respondents who have less support have 0.21 times the chance to experience depression than respondents who have good support, with a 95% confidence level in the range between 0.078 and 0.566 (Table 4).

The results of the logistic regression showed that only family support variables had p value of 0.002 < 0.005, so that no variables were excluded from the model. From the results of the last step in step 4, it was found that only the independent variable family support was significant because it had p = 0.002 < 0.05 with a change in the OR value of 0.21. This means that the family support variable is the variable that has the most influence on the incidence of depression in breast cancer patients at RSUPN Dr. Cipto Mangunkusumo. From the results of multivariate analysis, the OR or Exp (B) value of family support is 0.21 (95% CI: 0.078 - 0.566), meaning that respondents who have family support have less chance of 0.21 times to experience depression than respondents who have good family support.

Discussion

The incidence of depression in this study was more common in patients aged 20 - 59 years compared to patients aged over 59 years, and did not have a significant effect between age on the incidence of depression in breast cancer patients,

as well as the results of research from Srivastava *et al*. (2016) [9], the majority of patients were in the age group of 41 - 60 years (59.5%) followed by the age group 20 - 40 years (34.0%) women showing the highest prevalence of breast cancer. This finding is supported by research conducted by Hassan *et al*. (2015) [10] and The National Cancer Registry 2013 (2014), which show that the most common age of breast cancer is between 40 and 49 years with a mean age of 50 years.

This study showed that there was no significant effect between the level of education and the incidence of depression, in contrast to the results of research conducted by (Hopwood *et al*., 2010; Bener *et al*., 2017) [11], [12], which reported a significant effect between the level of education and the incidence of depression. From the percentage of depression occurrences, there is also no significant effect between the percentage of depression occurrences in respondents who have a low level of education compared to respondents who have a high level of education, higher education status can have better access to information about their health condition and are fully aware of and understand the treatment plan and what is expected of it.

In contrast to the results of Inhester L's research (2017) [13], the majority of illiterate women or low levels of education were found with the highest prevalence of breast cancer. For the impact of psychiatric morbidity due to education level, the prevalence of anxiety is more in women with illiteracy or low education levels compared to higher education levels (high school or college/university). In women with depression, low and high education levels were found to have the same prevalence. In a study conducted by Rogers LQ (2017) [14] found that the lower levels of education have been found to be a predictor of psychological comorbidity in patients with breast cancer. This can somehow be explained by the fact that patients with a higher level of education have a greater chance of being aware of their disease and its related aspects.

The results of this study indicate that there is no significant effect between spouse ownership on the incidence of depression in breast cancer patients, this may be due to the epidemiological data of breast cancer patients at the Dr. Cipto Mangunkusumo General Hospital Jakarta, the number of breast cancer patients is more with the status of having a life partner.

Married women were found to have the highest prevalence of breast cancer. For the impact of psychiatric morbidity due to marital status, single or married women were found to have the same prevalence of anxiety, respectively. However, single women show a much higher prevalence of depression than married women. The results of Srivastava's

research (2016) [9] show that married women are more depressed because they have a family to take care of which is the biggest commitment in their life while single women are more anxious because they may be afraid of needing a partner or friend to care for during illness. Feeling low self-esteem after surgery can contribute to psychiatric morbidity. Since the perception of breast cancer as a fatal disease, they are more worried about their life and their future. In this study, partner ownership had no effect on depression but not with anxiety. Although different from the research conducted by Hassan *et al*. [10], showed that both the civil status of the patients (married, widowed, and single) and their life situation (live alone or with a partner) were significantly related to the prevalence of anxiety and depression.

The results of this study can be concluded that the incidence of depression in breast cancer patients is more in respondents who do not work, this can be caused because patients with malignancy tend not to work compared to those who work, because the incidence of depression in patients who work is actually lower than those who work, because with daily activities it will reduce the psychological burden experienced by breast cancer sufferers [15].

From the results of this study, it was found that the majority of the incidence of depression in breast cancer patients mostly occurred in respondents with negative self-esteem, who experienced depression compared to respondents who had positive self-esteem. From the statistical test, it was found that there was no significant effect between self-esteem and the incidence of depression in breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta.

High self-esteem is associated with the ability to cope more effectively with life problems and lower levels of depressive symptoms [16] presuming that high self-esteem reduces perceptions of stress, whereas hopelessness, which usually occurs with depression, increase the perception of stress. The previous studies of depression in Korean and Western women suggested that self-esteem mediates the effects of stress. In a study of American women after mastectomy [17], found that self-esteem and women's views of themselves are directly related to mood states, and these can take several years to resolve.

The study showed that it was found that the majority of the incidence of depression in breast cancer patients occurred in respondents who experienced anxiety compared to respondents who did not experience anxiety. From the statistical test, it was reported that there was a significant influence between anxiety and depression in breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta.

The majority of the incidence of depression in breast cancer patients mostly occurs in respondents who experience stress compared to respondents who do not experience stress. From the statistical test, it was found that there was no significant effect between the stress variables on the incidence of depression in breast cancer patients at Dr. Cipto Mangunkusumo General Hospital Jakarta. Although stress is a common psychological problem in cancer patients, cognitive and physiological responses to stress, as well as coping styles (i.e. the way individuals try to restore disturbed homeostasis to maintain well-being in stressful situations), vary widely among individuals [18].

This study found that family support has a significant effect on the incidence of depression in breast cancer patients, and family support is the dominant factor influencing the incidence of depression in breast cancer patients, as well as the results of research conducted by Jafari et al. [19] reported that family support is very influential on the incidence of depression, this is evidenced by the more good family support is obtained, then the possibility of depression will decrease, on the contrary the reduced family support, the possibility of increasing the incidence of depression in breast cancer patients.

Family support has a significant influence on the incidence of depression in breast cancer patients, this can be seen from the number of respondents who received good family support more than those who received less family support, so that the results in this study showed that more than half of the respondents who did not experience depression compared to respondents who are depressed, this can be associated with high family support for breast cancer patients, it can reduce the incidence of depression in breast cancer patients.

Family support is an important factor in breast cancer patients, and research studies have shown that higher family support is associated with a lower risk of depression [20]. Most studies place emphasis on assessing the severity of depression so that interventions can be tailored to the patient's needs, ranging from small counseling sessions to medication or psychotherapy.

Research limitations

In this study, data collection was only carried out once, namely at the time of data collection, so that it only knew the incidence of depression in breast cancer patients at the time of data collection, and could not know the incidence of depression in the past and in the future.

Implication

The results of this study can be used as a reference for evaluating and knowing the incidence of depression in breast cancer patients, it can be used as a consideration for hospitals to make depression

screening programs in breast cancer patients, so as to detect the incidence of depression in breast cancer patients. More attention should be paid to breast cancer patients who are experiencing psychological distress. Given the high prevalence of psychosocial stress and its side effects on cancer recurrence and death, it is recommended to carry out routine screening and early detection. Because depression and anxiety can change across the cancer treatment trajectory, regular screening can help effectively monitor psychological changes in the early period and allow for timely intervention to prevent them from getting worse.

Conclusion

The incidence of depression in breast cancer patients is influenced by several factors that can influence the incidence of depression in breast cancer patients, namely age, education level, partner ownership, work, self-esteem, anxiety, stress, and family support. In this study, the majority of respondents were in the adult age group (20 - 59 years old), had low education, had a partner status, did not work/housewives, had negative self-esteem, experienced anxiety, did not experience stress, and received good family support. Statistically, there is no significant effect between age, education, marital status, occupation, income, self-esteem, and stress on the incidence of depression, while anxiety and family support have a significant effect on the incidence of depression in breast cancer patients. The dominant factor that most influences the incidence of depression in breast cancer patients is only the family support factor, so that family support is an important factor that can reduce the incidence of depression in breast cancer patients.

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