Factors Associated with Anxiety and Depression in Cemotherapy Patients

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Abstract. Cancer is an abnormal cell growth that is caused by a mutation genes in the human body that can turn malignant. One therapy which is used in suppressing the growth of cancer cells is chemotherapy. Wrong One effect of chemotherapy is the emergence of anxiety due to its side effects arising from chemotherapy. The phenomenon found in the chemotherapy room is There are 4 dominant factors, including age, gender, education and type of cancer. This research was conducted to determine the factors associated with anxiety in patients undergoing chemotherapy at BP Batam Hospital. Method research with quantitative methods. The sample consisted of 60 respondents who underwent chemotherapy at BP Batam Hospital in 2021 with sampling techniques namely total sampling. The data were processed using the Chi-square test. Analysis Univariate results the predominant patient characteristics were aged 45-59 years 38 patients (63.3%), female gender 36 (60%), education level by level SMA 23 (38.3%), Type of breast cancer 36 (60%), the 3rd chemotherapy cycle 11 (18.3). Bivariate results showed that there was a relationship between age (p-value 0.000) and gender (p-value 0.037), and the type of cancer (p-value 0.000) at the level of anxiety and education has no significant relationship with the level of anxiety (p-value 0.836). It is concluded that age and type of cancer are the most related factors against anxiety. The results of this research are expected to be used as basic data for nurses in the nursing division and chemotherapy services at the BP Batam Hospital Exploitation of Batam to carry out activities to reduce anxiety on patients undergoing chemotherapy.

Keywords: Cancer, Chemotherapy, Anxiety Level

1 Introduction

Disease of cancer is a group of diseases that is characterized by the growth and spread of cells abnormal that is not controlled which could resulting in death. The cancer incidence rate is high and is the third leading cause of death in Indonesia after heart disease and stroke. Data that show in 2018, from 185 in the world there are 35 types of cancer that have been obtained by the investigators. Every year approximately 9.6 million people worldwide die from cancer and 1 in 6 deaths are caused by cancer (World Health Organization, 2018).

According to Globalcan data, taking ASEAN- wide data on the number of new cancer cases 2020 amounted to 2.2 million with the highest number of cancer cases in Southeast Asia, breast cancer 298,445 (25.8%), cervical cancer 190,874 (16.5%) and colon cancer 52,907 (4.6%). In 2013, the prevalence of the incidence of cancer in Indonesia by 1.4%, or about 347 792 inhabitants, while the incidence of cancer is highest is cancer of the cervix occupies the

sequence both with the prevalence of 0.8%, where the provinces with the highest prevalence in the Riau Islands, North Maluku and DI Yogyakarta. Referring to the data presented by Rikesdas 2018, there is a breast cancer rate of 42.1 per 100,000 population with an average death rate of 17 per 100,000 population and cervical cancer of 23.4 per 100,000 population with an average death rate of 13.9 per 100,000 population. (RISKESDAS, 2018)

Based on the data record of medical in Rumah Sakit Agency Concession Batam (RSBP) in September 2019 to September 2020 shows the number of patients were diagnosed with cancer and underwent chemotherapy as many as 807 people with the incidence of cancer is highest is cancer of the breast, cancer of the ovary, colon cancer and cancer cervix (RSBP 2019). From these data, interviews were conducted with patients who underwent chemotherapy at RSBP Batam, namely 10 patients interviewed 8 were female and 2 were male, aged around 40-60 years, experienced anxiety when diagnosed with cancer so they were afraid and anxious about undergoing chemotherapy but with The doctor and nurse explained that the patient wanted chemotherapy. 10 Patients who are about to undergo chemotherapy are very afraid and very anxious, the anxiety experienced by the patient because he has just taken his first chemotherapy procedure. It was found that some of the patients had their first chemotherapy, chemotherapy to cycle two and three seem more calm. But found also impact negatively on the Home Hospital BP Batam on worries that excessive at the time prior to therapy first who lived to do is patients are reluctant to undergo chemotherapy with reason dizziness, not tasty body, afraid and not ready to face treatment.

Subsequently found two patients who underwent chemotherapy with educational background not in school and not graduate school experience anxiety to chemotherapy to the next, whereas 8 patients with a high school education to diploma only feel anxiety when the first time undergoing chemotherapy and subsequent chemotherapy was quieter. Female patients with breast cancer have higher anxiety about cancer due to fear of not being able to get together with family anymore and disturbing body image.

Patients with thyroid cancer who will do the third chemotherapy, saying that he had felt tired doing chemotherapy is routinely because he felt less believe themselves to be the change that he experienced in himself. The patient with ovarian cancer received his third chemotherapy, said that he was no longer anxious because he could accept everything that was happening to him, he also said that he was excited to undergo chemotherapy because he wanted to recover quickly from his illness.

Study Preliminary were carried out in harmony with the research that is carried out by Tsaras 2018 on anxiety in cancer patients that analyzes multivariable showed that symptoms of anxiety were more severe associated with age ≥60 years, the type of sex women, where lived the outskirts of the city, an index of mass body <18.5, and cancer stage III. Age ≥60 years, the type of sex women. (Tsaras et al., 2018)

According to the study (Putra Shah, 2015) entitled Relationship Support Families with Level Anxiety in Patients Cancer in Undergoing Chemotherapy in RSU Dr. Pirngadi city of Medan in 2015. Based on the results of the distribution of the frequency of the level of anxiety in patients with cancer to undergo chemotherapy obtained the majority of the anxiety level of patients undergoing chemotherapy in a majority of light as much as 26 patients (44.1%). According to researchers this is caused by other than good family support, the majority of patients undergoing chemotherapy are in the third chemotherapy cycle (22 patients) so that the patient‘s anxiety level has started to decrease. In addition to the chemotherapy cycle factor, the level of anxiety is also influenced by age. The factor related to the patient‘s anxiety level in undergoing chemotherapy is the patient‘s age. The patient‘s experience in undergoing treatment is also an intrinsic factor related to the patient‘s level of anxiety.

From the results of interviews that have been conducted and theories that are in the background behind the causes associated with anxiety that the diagnosis of cancer, chemotherapy prime and four dominant factors found in Batam Bp Hospital such as age, sex, type of cancer and education. Therefore, researchers are interested in examining the anxiety level of chemotherapy patients while undergoing chemotherapy and then analyzing factors related to chemotherapy patient anxiety, factors such as age, gender, education level, type of cancer.

2 Method

This research was conducted with the design *of quantitative* using questionnaires ZSAS *(Zung Self-Rating Anxiety Scale.* The independent variables in this study were age, gender, education level, type of cancer, and the dependent variable is the level of anxiety of patients who undergo chemotherapy. The data were taken using a questionnaire, The data were analyzed using the *chi-square* technique.The population and sample of the study were 60 patients.

3 Results and Discussion

3.1 Univariate Analysis

a. Patient Characteristics Based on Age

Table 1. Distribution of Age Characteristics of Chemotherapy Patients at BP Batam Hospital 2021

Age	Amount	Percentage (%)
17-25 years	1	1.7
26-35 years	4	6.7
36-44 years	8	13.3
45-59 years	38	63.3
60-74 years	9	15.0

Table 1 shows that the majority of patients are in the age range 45-59 years as many as 38 patients (63.3%)

b. Characteristics of Patients by Type Sex

Table 2. Distribution Characteristics Type Gender Chemotherapy at Home Hospital BP Batam 2021

Type Sex	Amount	Percentage (%)
Man	24	40
Women	36	60
Total	**60**	**100.0**

Table 2 shows that 60 patients who have male gender are 24 people (40%) and female as many as 36 people (60%).

c. Patient Characteristics Based on Education

Table 3. Distribution of Chemotherapy Education Characteristics at BP Batam Hospital 2021

Education	amount	Percentage (%)
Not school	6	10.0
SD	12	20.0
Junior High	10	16.7
High school	23	38.3
bachelor	9	15.0
Total	**60**	**100.0**

Table 3 shows that the majority of education in patient chemotherapy are high school graduates with 23 people (38.3%) and the least little school which 6 (10%).

d. Patient Characteristics Based on Cancer Type

Table 4. Distribution of Characteristics of Types of Chemotherapy Cancer at BP Batam Hospital 2021

Types of Cancer	Amount	Percentage (%)
Breast	36	60.0
Testicles	11	11.7
Ca Colon	13	13.3
Total	**60**	**100.0**

Table 4 shows that the majority of cancer chemotherapy at BP Batam Hospital is breast cancer, 36 people (60%), Testicular Cancer (13.3%), Colon Cancer (colon) 13 people (11.7%).

e. Patient Characteristics Based on Chemotherapy Cycles

Table 5. Distribution of Chemotherapy Cycle Characteristics

Cycle	Amount	Percentage (%)
Cycle 1	25	46.7
Cycle 2	10	8.3
Cycle 3	11	18.3
Cycle 5	2	3.3
Cycle 6	2	1.7
Cycle 7	4	6.7

Table 5 shows that the majority of patients with cancer who undergo chemotherapy with the cycle of the 1st 28 people (46.7%) and cycle the bit cycle 6 (1.7%).

f. Anxiety Level Category

Table 6. Distribution of the frequency of anxiety levels

Category	Amount	Percentage (%)
Mild anxiety	20	33.3
Moderate Anxious	31	51.7
anxious weight	9	1.5
Total	**60**	**100.0**

Table 6 shows that the category of anxiety in cancer patients undergoing chemotherapy at BP Batam Hospital is the majority of moderate anxiety is 31 people (51.7%), mild anxiety is 20 people (33.3%) and Anxious weight 9 (1.5%).

3.2 Bivariate Analysis

a. Bivariate Analysis Results

The bivariate analysis was performed using *chi-square* to determine the relationship between gender, education, gender, age on the level of anxiety of patients who undergo chemotherapy. With the normality test using the *Kolmogorov-Smirnov*, the results of all factors are normally distributed (> 0.05) and then tested by *chi-square is* carried out using SPSS statistical software.

Table 7. Distribution of factors related to the level of anxiety in chemotherapy patients

Characteristics Demographics	Light anxiety N (%)	Being anxious N (%)	anxious weight N (%)	P *value*
Age				0.037
17-25 years	0	1 (100%)	0	
26-35 years	2 (50%)	2 (50%)	0	
36-44 years	5 (62.5%)	3 (37.5%)	0	
45-59 years	8 (21.1%)	21 (55.3%)	9 (23.7%)	
60-74 years	5 (55.6%)	4 (44.4%)	0	
Type Gender:				
Man	18 (75%)	6 (25%)	0 (0%)	0,000
Women	2 (6.9%)	25 (69.4%)	9 (25%)	
Education:				
Not school	2 (33.3%)	2 (6.5%)	2 (33.3%)	0.836
Elementary	4 (33.3%)	7 (58.3%)	1 (8.3%)	
Junior High	2 (20%)	7 (70%)	1 (10%)	
High school	8 (34.8%)	11 (47.8%)	4 (17.4%)	
Bachelor	4 (44.4%)	4 (44.4%)	1 (11.1%)	
Cancer Type:				
Breast	2 (5.6%)	25 (69.4%)	9 (25%)	0,000
Testicles	10 (90.9%)	1 (9.1%)	0	
Ca Colon	8 (61.5%)	5 (38.5%)	0	

Results of the study found the age of the majority of 45-59 years with anxiety were 21 (55.3%), anxiety heavy 9 (23.2%) with contained the relationship between age and anxiety level with a *p-value of* 0.037. Furthermore, patients with various sex women with levels of anxiety mild 2 (6.9%), anxiety were 25 (69.4%) and severe anxiety 9 (25%) and male patients with mild anxiety levels of 18 (75%), anxiety while 6 (25%) with *p-value* = 0.000 indicates a relationship between gender and anxiety level. Furthermore, the level of education the majority of patients who undergo chemotherapy have anxiety were 11 (47.8%) with education graduate high school with a *p- value* = 0.836, which means there is no relationship between education and the level of anxiety. Furthermore, with the majority of cancer types of cancer breast with anxiety were 25 (69.4%) with a *p-value* = 0.000.

4 Discussion

4.1 Overview The level of anxiety Patients who Undergoing Chemotherapy at Home Hospital Board of Batam.

The results of research conducted at BP Batam Hospital found that 60% (36 people) of cancer patients experienced moderate anxiety. This research is in line with research (Manullang, 2020) with the patient‘s anxiety levels of cancer in undergoing chemotherapy at the hospital. Haji Adam Malik Medan is mostly anxious (44.8%). Likewise with research (Damanik, 2015) on the level of anxiety of cancer patients undergoing chemotherapy at RUD Arifin Achmad, which stated that the majority of cancer patients undergoing chemotherapy were anxious (44.8%).

Assumptions investigators is that patients who undergo chemotherapy experience anxiety at being perceived levels in cancer patients undergoing chemotherapy is a natural thing, and this is still included in the responses are adaptive, patients answered questions with emotional responses, but they can be controlled.

Medium anxiety is a phase of anxiety where the perception of the environment decreases, the individual focuses more on important things at that time, putting other things aside so that someone experiences selective attention but can do something more focused (Stuart and Sundeen, 1998) in research (Hayati, 2016). Manifestations can be seen from the level of anxiety was it among others anxious / nervous, afraid for no apparent reason, frequent urination, difficulty sleeping, headache, sore throat or sore muscles, shortness of breath, hands cold and always sweaty.

The assumption of the next researcher is that the results of the questions that have the dominant answer are that patients who have anxiety are experiencing complaints of insomnia, headaches, neck pain, which are influenced by the effects of chemotherapy. Even though they are familiar with chemotherapy treatment, patients still cannot avoid the effects of chemotherapy which cause anxiety.

This study was supported by research (Myungsun & Yongae, 2015) regarding the administration of chemotherapy at specific frequencies according to the type of drug chemotherapy can result in a change in the status of functional respondents due to the effect of the side which inflicted. Effects of chemotherapy in patients can affect in the biological, physical, psychological, and social. Effects of chemotherapy greatly vary depending on the drug were administered. Effects side that weight often arise in patients after chemotherapy and often times can not be tolerated by the patient, and even cause death. This is strengthened by research (Setiawan, 2015) explaining the influence of patient adaptation about chemotherapy on the anxiety level of chemotherapy patients. Anxiety is also an important part of the personality system, which is a foundation and center for the development of behavioral neurosis and psychosis.

4.2 Relationship Age with Anxiety Patients who Undergoing Chemotherapy in Hospital Board of Batam.

The results of the study with the test statistic by using test of *chi-square* shows the percentage difference significant with $p = 0.037$ (<0.05) with the age of the majority of 45-59 years with anxiety were 21 (55.3%), anxiously weight of 9 (23, 2%). The results of this study are in line with statistical tests by using test of *chi-square* shows the difference in percentage is meaningful with $p = 0.005$ means there is a significant relationship between mother‘s age with chemotherapy in breast cancer mother in Rumah Sakit Umum Daerah Zainoel Abidin Banda Aceh in 2018.

The assumption of the researchers is that the number of patients 60 and 38 chemotherapy patients is between the ages of 45-59 years, with dominant chemotherapy cycles of the initial cycle 1,2,3 which can cause high anxiety in chemotherapy patients and patients with breast dominant cancer.

The results of this research are also in accordance with the results of the research conducted (Anwar, 2018). Middle adulthood is the longest age range in the developmental period. The age limit for middle adulthood begins around the age of 40 to 65 years. Most individuals in this age in cancer patients breast feel very worried when the effect of the side of the chemotherapy would make her not interesting, so that will arise feelings angry at the circumstances and not infrequently with rejection of the actions of chemotherapy.

The next researcher‘s assumption is that the age between 45-59 includes those who are still categorized as active to do work and other activities, the researchers found that some of the patients are no longer working because they have to undergo chemotherapy due to cancer, resulting in anxiety because they feel they are not productive and become a burden.

The researcher‘s assumptions are supported by the journal (Inhestern et al., 2017) which reveals that cancer patients with productive working age (15-65 years) with the development of cancer and chemotherapy, which may be a cause of stress even years after diagnosis. People with cancer need to adapt to the uncertainty of cancer diseases, which can affect work life and family life and can increase anxiety. To fulfill their developmental tasks, cancer survivors of working age struggle to keep working, raise their children and return to ‘normal‘ life, which can pose additional burdens.

4.3 The Relationship between Gender and Anxiety of Patients Undergoing Chemotherapy at the Batam Business Administration Hospital.

The results of analysis conducted by researchers relationship sex with patient anxiety is 9 (25%) patients with female sex experience level of anxiety by weight, 25 (69.4%) experienced anxiety moderate, 15 (40.5%) experienced mild anxiety. Patient sex male experiencing mild anxiety 18 (75%) and anxiety were 6 patients (25%) with the results of the study with the test statistic by using test of *chi-square* shows the difference in the percentage significant with p = 0.000 means that there is a relationship between the type of genitalia with anxiety levels. In a study that found that the number of female patients and male more dominant women because that was found was a patient of women with this type of breast cancer.

According to the assumptions of researchers women more at risk of cancer than women because women prone to emotion and feeling is great so if excessive can cause a decrease in immunity for relying too much emotion. This statement is supported by theory (Lubis, 2009) in research (Wulandari, 2015) that women when in a state of stress or emotions such as anger and sadness, the hypothalamus which is the center of emotions will be stimulated and then will stimulate the pituitary gland, which in turn stimulates the adrenal glands, so out hormones glucocorticoids. If the hormones are out in excessive will occur damage to the body that lead to antibodies and decreased inflammatory response. The reduced system of immunity is facilitate the entry of cancer cells attack the body, because of the ability of these cells to recognize and fight the enemy can not function as well.

4.4 Relationship Education with Anxiety Patients who Undergoing Chemotherapy at Home Hospital Board Concession Batam.

The results of the analysis further, namely the relationship of education with the anxiety of patients who undergo chemotherapy are the majority of educational end high school with anxiety lightweight 8 (34.8%), anxiety was 11 (478%) and anxiety weighs 4 (17.4%) with the result that there is a relationship education with a level of anxiety with p = 0.836 with a significance level of $\alpha = 0.05$. The results showed that there was no significant relationship between education level and anxiety. Patients with levels of education undergraduate experience severe anxiety one patient, while in patients with primary school education only one who experienced severe anxiety, but at the level of higher education is high school there were 14 patients with anxiety moderate and severe.

The assumption of researchers is that the background behind education is not associated with the level of anxiety a person in the face of chemotherapy, because of the level of education a person‘s status can not be associated with the perception that can cause anxiety. Results of the study found that there is no relation between education and the level of anxiety, researchers assume it can be seen from most of the patients had a level lower but have knowledge that sufficient in terms of chemotherapy, this occurs when patients with low education but actively looking for information either formally as well as non-formal to increase knowledge but have a

mild level of anxiety as well as some patients who have higher education who easily accept the information given also have a mild level of anxiety.

The assumption of researchers in line with the research (Arman, 2013) were performed in DI Dr DR. Wahidin Sudirohusodo Makasar, that is, based on the results of statistical tests using the program, the value of $p = 0.346$ with a significance level of $\alpha = 0.05$ was obtained. It's showed no relationship between the education level of the client with breast cancer and the client's anxiety level with chemotherapy. From the results of the analysis above, it can be concluded that there is no relationship between the level of education and the level of anxiety.

This is supported by the theory put forward by Stuart and Sundeen (1995) in research (Arman, 2013) which states that the more often a person experiences stressors, the experience in dealing with these stressors will increase so that the anxiety experienced decreases. This is different to that proposed by (Hawani, 2020) that the level of anxiety is associated with the level of education for someone in identifying stressors in themselves alone or outwardly, education levels are also associated with awareness and understanding of the stimulus.

4.5 Relationship Type Cancer with Anxiety Patients who Undergoing Chemotherapy at Home Hospital Board Concession Batam.

The results of the analysis conducted by researchers related to the type of cancer with patient anxiety, namely the majority of patients with breast cancer with mild anxiety 2 people (5.6%), moderate anxiety 25 (68.4%) and severe anxiety 9 (25%). with the results there is a relationship between the type of cancer and the level of anxiety with $p = 0.000 < 0.05$. The researchers' assumption is that breast cancer cases in hospitals are increasing from year to year and based on research by researchers. This is in line with research conducted (Damanik, 2015) regarding the anxiety of patients undergoing chemotherapy, it was found at Arifin Achmad Hospital that the majority of cancer patients studied were breast cancer with 19 patients (48.7%) of 39 patients, also found by researchers. (Manullang, 2020) the number of cancer most prevalent is breast cancer with the number of 31 (58.7%) patients darn reinforced with breast cancer data in 2020 with the number of patients with breast cancer continues to increase.

According to the assumptions of researchers, women are more at risk of cancer of breast compared to women by as factors of hormonal, where the hormone estrogen in women is more than that in men, with the exposure to estrogen which is higher in the breast gland, it will cause changes in the growth of cells in the breast gland. This is supported by peneltiian of the American Cancer Society (2020), states that the hormone estrogen stimulates the growth of glandular breasts, thus causing a change in the growth of cells of the mammary gland.

Researchers find cancer testis in space chemotherapy Rumah Sakit BP Batam by the number of patient 11, with predominant anxiety levels of light, according to the assumptions of researchers the number of patients who menagalmi testicular cancer are few and the majority of patients with testicular cancer with chemotherapy cycles were already ketahap further so that the level of anxiety low.

This study is in line with research (Zirti, Myh, & Yunir, 2020) that the prevalence of testicular cancer is not as much as other cancers with 3-10 new cases occurring per 100,000 men / per year in Western societies.2 However, testicular tumors are less common in Western society. In Asia compared to western countries, the incidence is very low at 0.4 per 100,000 population. According to research results (Cappuccio et al., 2018) men with testicular cancer have anxiety problems with body image, fertility and sexuality. This is the same as breast cancer in women with body image anxiety components.

5 Conclusion

Characteristics of patients who dominate are aged 45-59 years 38 patients (63.3%), type sex women 36 (60%), level of education to the level of high school 23 (38.3%), Types of cancer breast 36 (60%), cycles of chemotherapy to 3 11 (18.3). The categories of anxiety in cancer patients undergoing chemotherapy at the BP Batam Hospital were the majority of moderate anxiety, 31 patients (51.7%), 20 patients with mild anxiety (33.3%) and 9 patients with severe anxiety (1.5%). Results of the analysis were carried out research with the anxiety of patients with age is the result of p-value 0.037 < 0.05 means that H0 is rejected and Ha accepted that is, there is a significant relationship between age and patient anxiety, gender, namely the p-value of 0.000<0.05 means that H0 is rejected and Ha is accepted, that is, there is a significant relationship between gender and patient anxiety, education, namely the results of the p-value 0.836 <0, 05 means that H0 is accepted and Ha is rejected, that is, there is no significant relationship between education and patient anxiety, the type of cancer, namely the p-value of 0.000 <0.05 means that H0 is rejected and Ha is accepted, which is a significant relationship between the type of cancer and patient anxiety.

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