ORIGINAL ARTICLE

The Predictors of Adherence to Chemotherapy Among Women Newly Diagnosed With Stage I-III Breast Cancer in Indonesia

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ABSTRACT

Introduction: In Indonesia, the prevalence of breast cancer is continuously rising. There are several adverse consequences on non-adherence to care, It has negative effects for one's health and well-being. Previous research found that social support was linked to drug adherence in patients with heart failure, HIV, and first-episode psychosis. The purpose of this study was to look at factors of chemotherapy adherence in women newly diagnosed with stage I-III breast cancer. **Methods:** This study was conducted in six cancer centers in Jakarta, Indonesia, using a cross-sectional technique. Women over the age of 18 who had been diagnosed with breast cancer were screened. The binary logistic regression method was used. **Results:** The study's final sample for analysis included 121 women with early-stage breast cancer. At treatment completion, the patient's overall capacity to achieve the appropriate chemotherapy dose within the specified time period was 56 percent vs. 44 percent of the entire prescribed dose. Comorbidities (Adjusted OR= 0.93; CI 95=: 0.39 – 0.99), family income (Adjusted OR= 2.62; CI 95=: 0.57 – 8.83), and employment status (Adjusted OR= 2.07; CI 95=0.48 – 5.77) were all linked with adherence to chemotherapy. Patients who had intermediate social support (Adjusted OR= 2.91; CI 95=0.73–7.29) and strong social support (Adjusted OR= 2.41; CI 95=1.39–5.51) were more likely to adhere to chemotherapy. **Conclusion:** This information assists in identifying and supporting Indonesian women who may be at risk of nonadherence in a clinical context.

Keywords: Adherence, Chemotherapy, Breast cancer, Social support, Social determinant

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INTRODUCTION

With around 274.5 million inhabitants, Indonesia is the world's fourth most populous country, accounting for 3.51 percent of the total global population(1). Breast cancer is the major cause of cancer death among women in low- and middle-income nations(2). Between 2012 and 2018, the prevalence of breast cancer in women grew from 48.9 percent to 58.3 percent, with significant differences between Indonesian regions (2). The risk of annual premature death from cancer is expected to decrease from 6.71% in 2000 to 5.95% in 2030 (2). The high prevalence of advance disease and death

in breast cancer is due to the absence of a screening test, and inadequate access to or accessibility of care, according to the Health Ministry of Indonesia (3). In developing countries such as Indonesia, only 5 percent of women were tested, compared with 40 percent in developed countries (4). Most women with breast cancer seek medical treatment only once they have symptoms and are detected at an advanced stage (3). Approximately 93%-100% of Stage I and II breast cancer patients received sufficient therapy could only live for at least five years, while Stage III and IV patients could survive for at least one to two years (3).

Chemotherapy is the only known comprehensive therapeutic option for breast cancer. Chemotherapy for breast cancer clearly boosts benefits, lowers chances of relapse, and increases survival among appropriately

selected patients. The time of the start of therapy is important, and delays in therapy are associated with even worse recovery (5). It has been reported that women encounter more serious symptoms, particularly pain and neuropathic pain, when undergoing breast cancer chemotherapy (6,7). The ability of each patient to accept treatment will eventually affect her adherence. Patients with treatment-related complications that are worse or poorly managed may be more likely to stop therapy earlier through patient demands or noncompliance to treatments, and through therapeutic choices to reduce continuing toxicity.

Adherence to treatment plans has been defined as "the ability to administer and get the entire course of care as prescribed within an acceptable time period." According to the International Society for Pharmacoeconomics and Outcomes Research, compliance / adherence to therapy is "the amount or level of obedience (more correctly a percentage) to the provider's guidelines day to day care with regard to duration, dose, and intensity." (8). Several chemotherapy adherence studies assess the initiation of chemotherapy but do not determine the duration or number of doses taken after the initial chemotherapy dosage. The definition of relative dosage rate, the proportion of chemotherapy provided above the percentage received during a specific time period, has been proposed to further quantify the concept of adherence to therapy in breast cancer. A relative dose rate of 85 percent of the required treatment within a particular interval is linked to poor survival rates (9).

There are several adverse consequences on non-adherence to care, namely decreased therapy success, reduced overall survival, elevated hospital admissions, longer stay times, and higher frequencies of doctor visits (10). In addition, non - adherence with chemotherapy are potential explanations for the worse results of breast (11). Identification of possible causes for non-adherence is therefore critical for enhancing survival and also for designing strategies that encourage chemotherapy adherence. There is, however, limited evidence examining patient factors influencing adherence to chemotherapy for breast cancer and it has not cantered explicitly on women with breast cancer in Indonesia (10,12–14). There are many factors considered to correlate to non-adherence to the treatment of breast cancer. These variables could include multilevel barriers to care: patient, healthcare professional, and institutional. Among these recognized issues are breast cancer beliefs and attitudes, as well as inaccurate information about risk and treatment effectiveness (10). Healthcare system mistrust is widespread as well as provider discrimination, with poorer interaction observed with practitioners who are primarily racially discordant (15). Women may require therapy as a result of un(der)insurance, out-of-pocket expenses, and the necessity for additional travel and childcare (16,17). Social health determinants

such as poverty, a lack of education, and a lack of health care coverage all play a significant impact in health disparities (4). Disparity in cancer care, specifically chemotherapy, is an underrecognized feature of possible causative variables for difference in survival.

Generally, supportive relationships are being linked to greater compliance to care (18). Through its influence on care decisions, social support can be critical to treatment management. (18), or lessening of emotional suffering (19)and symptom intensity (20). A study of French women aged 18-40 years showed there were more tamoxifen disruptions (21)and a higher tendency of tamoxifen discontinuation for women experiencing a limited number of supportive individuals in their social network (22). Another study found substantial correlation between levels of personal social care and adherence to adjuvant endocrine therapy among women with breast Cancer (23). Although one study found that social support did not contribute to adherence improvements among women undergoing adjuvant endocrine treatment adherence (13,24). Due to a lack of research on chemotherapy adherence, small previous studies, and a lack of research in different breast cancer patients, we investigated the relationship between social economic status and social support for adherence to chemotherapy among women newly diagnosed with stage I-III breast cancer.

MATERIALS AND METHODS

Design
This study was conducted in six cancer centers in Jakarta, Indonesia, using a cross-sectional technique.

Sample
Women over the age of 18 who had been diagnosed with some form of breast cancer were screened. Physicians were able to determine who was eligible. If a participating medical oncologist prescribed and administered chemotherapy, the individuals were eligible. Subjects were omitted if their cognition was impaired (mini-Mental State Test score 22) or if they demonstrated a low level of Indonesian language proficiency. Participants were chosen using a convenience sampling technique.

Instrument
Sociodemographic factors were calculated as covariates using a 23-item investigator-derived sociodemographic questionnaire. Age, education level, marital status, employment status, religious value, salaries, if compensation covers basic human requirements, whether health insurance covers healthcare costs and drugs, stage of breast cancer, and number of comorbidities are the variables utilized as independent variables in this research.

The 19-item Medical Outcomes Research Social Support (MOS-SS) survey, which examines emotional/ informational support, tangible support, pleasant social contact, and affectionate support, was used to conduct a multidimensional social support questionnaire for patients with chronic disease. The Likert scale responses ranged from none to all the time. Personal social support was determined as the sum of these ideals. The reliability in each of the sub-scales and total variable in our study was previously stated (Cronbach's alpha 0.89–0.96) and factor structure verified (25) (Cronbach's alpha 0.89–0.96).

Adherence has been defined as the proportion of chemotherapy doses provided as a percentage of the total number of doses recommended at the time of the initial prescription. The adherence rate encompassed the time period given, which was initially planned for the prescription of chemotherapy. Participants were then dichotomized (yes / no) based on their capacity to receive more than 85 percent of the recommended chemotherapy by the stipulated midpoint and endpoint. The strength of the dosages was calculated as the percentage of chemotherapy obtained by dividing the amount of chemotherapy received by the amount of chemotherapy recommended as a function of the prescribed period. For example, if someone was given four chemotherapy treatments but only received three within the prescribed time frame, their adherence would be 75 percent, and so 85 percent adherence would not have been attained.

Data Collection
This research has been accepted by the Associated University Ethics Committee and the Studied Hospital Ethics Committee. The research informs the study purpose, eligibility, procedure, and ethical protection to the clinical manager. The clinical manager helps to identify potential participants as the inclusion and exclusion criteria. After that, researcher approach potential participant and explain all study procedure. Written informed consent was given by all patients, and all personal information was kept private and documentation was rendered anonymous. The researchers collected data through face-to - face interviews with patients who, after describing the intent of the study, agreed to participate in the research.

Data analysis
The data was then managed using SPSS version 23. Based on the level of measurement and data distribution of the variables, descriptive statistics (mean, standard deviation, range, frequency) were employed to characterize the study sample as well as adherence to chemotherapy treatment. The data was checked for consistency, missing data, and compliance with the binary logistic regression assumptions. To obtain more uniform group breakdowns, all category predictors were reduced to dichotomous variables.

Binary logistic regression was used to see if the independent variables predicted the binary dependent variable of 85 percent adherence to recommended chemotherapy for breast cancer. Because the dependent variable is dichotomous, binary logistic regression is an appropriate statistical approach for these findings (25). Univariate and multivariate binary logistic models were performed to determine modified odds ratios and define independent patient specific drivers of chemotherapy adherence. In all models, the degree of relevance for two-sided hypothesis testing was set at 0.05.

Ethical Clearance
This study was approved by Research Ethics Committee, Departement of Nursing, Sekolah Tinggi Ilmu Keperawatan Jawa Barat No. 0111/KEPK/STIKEP/ PPNI/JABAR/VIII/2019

RESULTS

The final analysis sample comprised of 121 women with early stage breast cancer (40 percent were at stage 2 and 52 percent at stage 3). Five patients with stage 4 breast cancer were excluded from the final analysis. The demographics of all research participants are shown in Table I. The average age of the participants was 48.51 years, and they had less than a junior high education. The majority of women (88%) were married, 88 percent were Muslim, and around one-third (30.4%) worked full or part time. Only 58.4 percent of individuals had coverage for health care expenditures, despite the fact that all participants had prescription coverage.

At treatment completion, the patient's overall capacity to achieve the appropriate chemotherapy dose within the specified time period was 56 percent vs. 44 percent of the entire prescribed dose. Among the sociodemographic characteristics studied, good adherence to chemotherapy was found to be substantially linked (p.05) with fewer comorbidities, household income, and work status (Table I).

Table II presents social support as well as subscale scores. The average score for social support was 63.45 (SD=18.36), with tangible support and affectionate support receiving the highest subscale scores. Women who had a lot of social support were more likely to get chemotherapy than women who didn't have a lot of social support.

Comorbidities (Adjusted OR= 0.93; CI 95=: 0.39 – 0.99), household income (above basic minimum regional salary: Adjusted OR= 2.62; CI 95=: 0.57 – 8.83), and employment status (Adjusted OR= 2.07; CI 95=0.48 – 5.77) were significantly associated with adherence to chemotherapy, according to multivariate analysis (Table III). Patients who had intermediate social support

Table I : Demographic and social-economic characteristics (n=125)

Variable	Total (N=125)	85% Adherence: Yes (n=70)	85% Adherence: No (n=55)
	Mean ± SD or n (%)	Mean ± SD or n (%)	Mean ± SD or n (%)
Age (year)	48.51 ± 11.34	49.32 ± 13.54	48.92 ± 9.05
Education			
Under junior high school	75 (60.0)	25 (35.7)	50 (90.9)
Above junior high school	50 (40.0)	45 (64.3)	5 (9.1)
Comorbidities (total)	2.12 ± 0.78	2.98 ± 1.02	2.56 ± 1.13
Household income			
Under basic minimum regional salary	80 (64.0)	30 (42.9)	50 (90.9)
Above basic minimum regional salary	45 (36.0)	40 (72.1)	5 (9.1)
Married	110 (88.0)	60 (85.7)	50 (90.9)
Employed	38 (30.4)	26 (37.1)	12 (21.8)
Religion			
Muslim	110 (88.0)	64 (91.3)	46 (83.6)
Non-Muslim	15 (12.0)	6 (8.7)	9 (16.4)
Insurance coverage for medication	125 (100)	70 (100)	55 (100)
Insurance coverage health care	73 (58.4)	44 (62.9)	29 (52.7)
Income meets basic needs			
Yes	56 (44.8)	23 (32.9)	23 (41.8)
No	69 (55.2)	47 (67.1)	32 (58.2)
Stage of diagnosis			
1	10 (8.0)	5 (7.1)	5 (9.1)
2	50 (40.0)	30 (42.9)	20 (36.4)
3	65 (52.0)	35 (50.0)	30 (54.5)

Table II : Social Support and Subscale Score (n=125)

Variable	Total (N=125)	85% Adherence: Yes (n=70)	85% Adherence: No (n=65)
	Mean ± SD	Mean ± SD	Mean ± SD
Total social support	63.45 ± 18.36	65.03 ± 12.76	61.82 ± 16.53
Emotional/informational support (range: 5 – 40)	30.91 ± 7.21	32.05 ± 8.41	29.71 ± 6.15
Tangible support (range: 4 – 20)	14.08 ± 6.52	13.87 ± 8.31	12.37 ± 5.73
Positive social interaction (range: 3 – 15)	9.57 ± 7.82	10.43 ± 5.28	9.02 ± 6.44
Affectionate support (range: 5 – 40)	11.35 ± 8.27	13.11 ± 9.10	11.07 ± 7.89

(Adjusted OR= 2.91; CI 95=0.73–7.29) and strong social support (Adjusted OR= 2.41; CI 95=1.39–5.51) were more likely to adhere to chemotherapy.

DISCUSSION

This study looks at patient-specific factors of adherence to chemotherapy for breast cancer in Indonesian women. According to the findings of this study, demographic characteristics such as work level, household income, and the number of comorbid conditions were important in predicting 85 percent adherence to chemotherapy in the adjusted model. This information aids in identifying and supporting Indonesian women who may be at risk of nonadherence in a therapeutic setting.

This study's findings have both similarities and differences with what is reported in the larger scientific literature on adherence to cancer and breast cancer therapy. In general, the literature shows that work level and the number of comorbidities are connected to cancer care adherence (26). However, the findings of the association between jobs and adherence have been varied, with results indicating that being a housewife, on sick leave, or retired were key predictors of cancer care adherence, or that adherence was not predicted by employment status. (27,28). The number of comorbidities in the adjusted models significantly predicted adherence to chemotherapy for breast cancer, according to this review. This outcome could be attributed to the participants' middle age and the larger number of comorbidities indicated by the individuals.

The more social support and socioeconomic status are, the more compliant they are in implementing chemotherapy treatment for breast cancer patients. The results of this study are in accordance with (29) theory which states that family support and socioeconomic status are processes that occur continuously throughout human life. Consistent with previous study conducted stated correlation between social support and socioeconomic status on chemotherapy adherence in breast cancer patients. The presence of social support will have an impact on patients' self-confidence as they face the process of treating their sickness. Cancer sufferers' physical and psychological well-being will be influenced by social support and socioeconomic situation. Cancer patients who have social support with a higher socioeconomic class can feel cared for, loved, that their life is precious, that they can share the load, that they can have confidence, and that they can build hope in order to ward off or minimize stress. The function of social support is critical in all aspects of health treatment for family members, from prevention to recovery. As a result, social support is critical for increasing hope, adherence to chemotherapy, and overall quality of life (30).

There has been little investigation into the specific determinants of chemotherapy adherence. It is important to recall that the majority of research on adherence factors is centered on oral endocrine medication, and the likelihood of adherence to chemotherapy in an Indonesian woman has never been fully examined. As a result, the findings of this study may be unique to this group, allowing for a very specific clinical application. The limited sample size of this study limits its scope. However, with a sample size of 125 individuals and 11 binary and constant predictor factors, a power analysis revealed that the minimum observable odds ratios in the larger

Table III : Final Binary Logistic Regression Analysis Results of Predictors of 85% Adherence to Breast Cancer Chemotherapy

Variable	Full Multivariate Model	
	Adjusted OR (95% CI)	***p-value***
Age (year)	1.01 (0.89 – 1.06)	0.816
Education (year)	1.07 (0.91 – 1.04)	0.957
Comorbidities (total)	0.93 (0.39 – 0.99)	0.034*
Household income		
Under basic minimum regional salary	Reference group	
Above basic minimum regional salary	2.62 (0.57 – 8.83)	0.042*
Married	1.41 (0.62 – 4.57)	0.116
Employed	2.07 (0.48 – 5.77)	0.013*
Religions		
Muslim	1.04 (0.91 – 1.16)	0.418
Non-Muslim	Reference group	
Insurance coverage for medication	0.94 (0.91 – 1.08)	0.912
Insurance coverage health care	1.04 (0.80 – 1.37)	0.436
Income meets basic needs		
Yes	1.87 (0.62 – 2.13)	0.410
No	Reference group	
Stadium of cancer		
1	Reference group	
2	1.71 (0.67 – 5.78)	0.214
3	1.86 (0.52 – 6.92)	0.372
Social support		
Low	Reference group	
Moderate	2.91 (0.73 – 7.29)	0.004*
High	2.41 (1.39 – 5.51)	0.001*

population would vary from 1.75 to 5.32. Furthermore, the quantity of incomplete information imputed on household income may limit the report's outcomes. While this property is shared by Jakarta and numerous other places in Indonesia, other urban areas may not be generalizable at all.

CONCLUSION

Overall, this study provided more evidence for the need to identify patients in Indonesia who may be at risk of failing to adhere to treatment. Clinicians should consider the patient's job position, family income, and the number of co-morbidities in particular. This acknowledgment would allow for individualized, customised care in order to achieve racially inclusive breast cancer therapy. Furthermore, physicians should be aware of the context of patients' social interactions, which may influence care management. Clinical teams may also be required to cover help gaps that could jeopardize patients' commitment to care.

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