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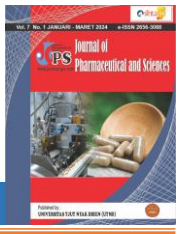

Breast Cancer Patients Receiving Tamoxifen Therapy at Two Private Hospitals in Central Java: Sociodemographic, Clinical, and Medication Profiles

Pasien Kanker Payudara yang Menerima Terapi Tamoxifen di Dua Rumah Sakit Swasta di Jawa Tengah: Profil Sosiodemografi, Klinis, dan Pengobatan

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Abstract

Breast cancer is one of the most common types of cancer, including in Central Java Province, Indonesia, which reports a high incidence. The number of cases continues to increase, likely due to low public awareness of breast self-examination (BSE), limited health education, and a lack of motivation to undergo regular check-ups. One of the main treatment options is hormonal therapy, with Tamoxifen being the most widely used drug. To date, there is limited data on the sociodemographic and clinical characteristics among breast cancer patients who use Tamoxifen in Central Java. This information is essential for improving patient care and treatment strategies. This study aimed to describe the sociodemographic and clinical characteristics of breast cancer patients who received Tamoxifen at two private hospitals in Central Java. The results showed that most patients were under 50 years old (66%), had a low level of education (65.2%), and were employed (34.8%). Clinically, most patients were in advanced stages (56.5%), had no comorbidities (89.7%), and were not taking other medications (85%). These findings provide an initial overview of the profile of breast cancer patients using tamoxifen at two private hospitals in Central Java. However, these results cannot be generalized to the entire Central Java region due to the limitations of the study locations. Further studies with a broader scope are needed to obtain more representative data.

***Keywords*: Breast cancer, Tamoxifen, Hormonal therapy, Sociodemographic characteristics, Clinical characteristics.**

Abstrak

Kanker payudara merupakan salah satu jenis kanker dengan prevalensi paling banyak. Provinsi Jawa Tengah merupakan salah satu provinsi di Indonesia dengan angka kejadian kanker payudara yang tinggi. Kasus kanker payudara di Jawa Tengah masih terus meningkat dikarenakan rendahnya kesadaran masyarakat terhadap Sadari (pemeriksaan payudara sendiri) dan pendidikan kesehatan serta motivasi untuk melakukan pemeriksaan rutin. Kanker payudara bisa ditangani dengan beberapa cara salah satunya terapi hormonal. Terapi hormonal yang menjadi pilihan utama adalah tamoxifen. Sampai saat ini data penelitian tentang karakteristik sosiodemografi dan klinis pada pasien kanker payudara yang menerima terapi tamoxifen di Jawa Tengah belum banyak dilakukan. Data ini dibutuhkan untuk merancang strategi dalam upaya peningkatan pelayanan kesehatan pada pasien kanker payudara. Oleh karena itu, penelitian ini bertujuan untuk memahami karakteristik sosiodemografi dan klinis pada pasien kanker payudara yang menerima terapi Tamoxifen di dua rumah sakit swasta di Jawa Tengah. Penelitian menunjukkan bahwa berdasarkan data karakteristik demografi didominasi pasien berusia <50 tahun (66%) dengan tingkat pendidikan yang rendah (65,2%) dan merupakan pekerja (34,8%). Hasil penelitian pada karakteristik klinis didominasi oleh pasien dengan stadium lanjut (56.5%), tidak memiliki komorbid (89,7%) dan tidak mengonsumsi obat lain (85%). Temuan ini memberikan gambaran awal mengenai profil pasien kanker payudara pengguna Tamoxifen di dua rumah sakit swasta di Jawa Tengah. Namun, hasil ini tidak dapat

digeneralisasi untuk seluruh wilayah Jawa Tengah karena keterbatasan lokasi studi. Studi lebih lanjut dengan cakupan yang lebih luas diperlukan untuk memperoleh data yang lebih representatif.

Kata Kunci: Kanker payudara, Tamoxifen, Terapi hormonal, Karakteristik sosiodeomografi, Karakteristik klinis.

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Introduction

Breast cancer is a malignancy caused by cells in the breast tissue that divide and grow uncontrollably. Breast cancer is also one of the most common types of cancer and has a high morbidity rate, especially in women. The International Agency for Research on Cancer (IARC) by the World Health Organization (WHO) stated that in 2020, female breast cancer became the most commonly diagnosed cancer type globally: about 2.26 million women were diagnosed with breast cancer, and about 685,000 women died from the disease. In Indonesia, the number of new cases of breast cancer reached 68,685 cases (16.6%) of the total 396,914 new cancer cases [1]. Breast cancer cases in Central Java in 2021 reached 8,287 people, while in 2022, they reached 10,530 people. This number shows an increase of 27 percent [2].

Breast cancer treatment currently involves a multidisciplinary approach, allowing treatment to be tailored to each patient's individual condition. Inappropriate treatment can lead to the spread of cancer cells to other organs, which can damage organ function and even lead to death. Therefore, cancer therapy is crucial to prevent recurrence and reduce mortality[3]. Every decision, from diagnosis to treatment, is discussed and decided collaboratively by surgical oncologists, medical oncologists, radiologists, and diagnostic imaging specialists, including surgery, systemic therapy, radiotherapy, endocrine therapy, additional investigations, and others [4].

It is known that more than 85% of breast cancer patients worldwide have hormone receptor-positive tumors. Therefore, treatment can be treated with endocrine hormone therapy for 5 to 10 years[5][6]. The standard adjuvant endocrine therapy (ET) for all women with hormone receptor-positive disease is tamoxifen, a treatment that has been used for over 2 decades and has extensive data on efficacy and toxicity [7][6].Tamoxifen, a selective estrogen receptor modulator, reduces recurrence and mortality in ER-positive breast cancer for both pre- and postmenopausal women. It acts as an estrogen antagonist in breast tissue but has estrogen-like effects on the endometrium, bones, coagulation, and lipid metabolism. Common side effects include hot flashes, vaginal discharge, and irregular menstruation [8][9].

Although tamoxifen is the primary hormonal therapy for breast cancer and is often available through national health insurance programs, inappropriate use or lack of monitoring for side effects and adherence can reduce the effectiveness of therapy. This is often related to sociodemographic and clinical factors, such as age, education, economic status, stage, and comorbidities. Therefore, the role of pharmacists in this regard is crucial. One way to provide optimal pharmaceutical care, personalize therapy by adjusting the regimen to the patient's clinical condition to ensure optimal dosage, frequency, and choice of drugs to minimize side effects, and improve the quality of life of breast cancer patients is by understanding the sociodemographic and clinical characteristics of breast cancer patients using tamoxifen therapy.[10].[11]. Knowledge of sociodemographic background (education, occupation, access to health care facilities, costs) helps design appropriate educational messages, identify barriers to adherence, and provide solutions to ensure patient adherence to therapy. Understanding economic capacity and indirect burdens allows pharmacists to

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recommend alternative generic drugs or provide information about available financial assistance or facilities [12].

Based on the description above, it is clear that understanding patient profiles is essential to providing pharmaceutical services. However, patient profile data at the private hospital level in Central Java is still limited and poorly documented. This study aims to fill this gap by mapping patient profiles in two private hospitals as a pilot study. These two hospitals were chosen because they are regional referral centers or have patients with unique characteristics (e.g., better access, different costs, referrals from specific regions), thus providing an opportunity to map profiles previously under-represented in national studies, which typically focus on public or large hospitals. The results of this study can further inform healthcare professionals in optimizing treatment and improving patients' quality of life.

Experimental Section

Material

Data from medical records of outpatients with breast cancer undergoing Tamoxifen therapy at two private hospitals in Central Java were utilized in this research, along with questionnaires linked to Google Forms distributed directly via WhatsApp and printed forms.

Study design

The study design was descriptive-observational, which involves observing and measuring variables without administering treatment. This study used a cross-sectional survey design.

Sampling technique

The sampling method in this study used purposive sampling, as data were collected intentionally from patients who met the inclusion criteria. The author determined the inclusion and exclusion criteria to ensure the sample did not deviate from the population. Patients with breast cancer who had been on Tamoxifen therapy for at least one month, were willing to participate in the survey, and accepted the conditions outlined in the informed consent form. 253 patients met the study's inclusion criteria. Sampling was conducted between July and September 2024.

Data collection

Data collection in this study utilized secondary data. In this study, data were obtained from records/archives or documentation related to the research variables at the target research sites. In this case, the secondary data consisted of medical records of patients receiving tamoxifen therapy at two private hospitals in Central Java.

Data analysis

Univariate analysis of categorical data is performed by presenting a summary of the data in a frequency distribution, either as percentages or ratios. The purpose of the analysis is to describe the overall condition of the respondents and explain each independent and dependent variable in the study.

Results and Discussion

A total of 253 patients met the inclusion criteria and participated. This study was conducted from July to September 2024. The subjects were breast cancer patients undergoing tamoxifen hormonal therapy at two private hospitals in Central Java. Respondent data were obtained through direct interviews, a sociodemographic form and a clinical characteristic form. Before commencing the study, the researcher obtained informed consent from the respondents by having them sign an informed consent form.

Sociodemographic characteristics of breast cancer patients receiving tamoxifen therapy in a private hospital in Central Java

Sociodemographic characteristics are crucial for understanding the overall background of the study subjects. This information provides a general overview of the patient's profile. Furthermore, understanding sociodemographic characteristics can help identify population groups at higher risk of certain diseases, assess whether access to treatment is equitable across socioeconomic status, and predict patient adherence to

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treatment. The sociodemographic variables examined included age, education level, occupation, and income. As presented in Table 1, the data yielded sociodemographic characteristic data.

Table 1. Sociodemographic Characteristics

Sociodemographic Characteristics		Freq. Percentage (%)
Age	Early adult (26-35 years)	11 (4.35%)
	Late adult (36-45 years)	98 (38.73%)
	Middle age (46-55 years)	101 (39.92%)
	Elderly (56-65 years)	37 (14.62%)
	Old (>65 years)	7 (2.77%)
Education	Elementary school	98 (38.7%)
	Junior high school	42 (16.6%)
	Senior high school	48 (19.0%)
	Diploma	15 (5.9%)
	Bachelor's degree	48 (19.0%)
	Master's degree	2 (0.8%)
working status	Working	165 (65.2%)
	Jobless	88 (34.8%)

Based on the research results, the age variable showed that patients were predominantly aged <50 years (167, 66%). This was obtained from patient data, including 101 middle-aged patients, of whom 58 were under 50 years old. This brings the total number of patients under 50 to 167 out of the total. In theory, older women are more likely to develop breast cancer. Fat cells in the breasts tend to produce large amounts of the aromatase enzyme, which ultimately increases local estrogen levels. This locally produced estrogen is believed to play a role in triggering breast cancer in postmenopausal women. [13]. However, it does not rule out the possibility of developing breast cancer in women under 50. Research conducted by a previous study [14] Data from hospitals in Jakarta, Indonesia, showed that the 40-year-old age group dominated the incidence of breast cancer. Many factors cause breast cancer to occur in those under 50, one of which is a lifestyle that leads to obesity. [15]. In addition, changes in reproductive factors, such as earlier menarche, result in more prolonged exposure to sexual hormones such as estrogen. [16].

Given the increasing incidence of breast cancer in women under 50, pharmacists play a crucial role in early education and prevention. They can provide counseling on lifestyle modifications to reduce risk factors, such as maintaining a healthy weight, balanced nutrition, and regular physical activity. Pharmacists are also well-positioned to educate patients about the impact of hormonal exposure, including early menarche, and the importance of regular screening and self-examination. In clinical settings, pharmacists support appropriate drug therapy, ensure adherence, monitor for side effects, and offer guidance tailored to the unique needs of younger breast cancer patients, who may face different emotional, reproductive, and social challenges compared to older patients.

According to a previous study [17]Education levels are divided into two categories: low education, comprising those with elementary and junior high school education, and high education, comprising those with high school and college education. In this study, the dominant educational level was low education, with 140 respondents (55.34%). Similar results were also presented in a survey conducted by [18]. Which found that there were actually more patients with low education. This is related to behavioral changes. A higher level of formal education facilitates the absorption of health-related information, thereby increasing a person's awareness of healthy lifestyles. These data show that the majority of patients have low to middle levels of education, which can affect their understanding of treatment and side-effect management. People with low education may not recognize the early symptoms of breast cancer (lumps, changes in the skin or breast) and therefore may not immediately realize that it could be serious. [19].

Data from the Trivandrum Cancer Registry shows that women with low education (illiterate or primary school) tend to be diagnosed at a more advanced stage of cancer than women with higher education. [20].In patients with low educational backgrounds, pharmacists have a key role in bridging knowledge gaps related to breast cancer treatment and early symptom recognition. They can simplify complex medical information into language that is easier to understand, ensuring patients fully comprehend

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their therapy, possible side effects, and the importance of adherence. Pharmacists can also use visual aids or verbal counseling to enhance understanding, especially for those with limited literacy. Additionally, by building trust and providing regular follow-up, pharmacists can empower patients to be more proactive in their care, improving outcomes through better education, awareness, and treatment adherence.

Employment status in this study was predominantly employed respondents (165, 65.2%). Working women tend to have a higher risk of breast cancer, especially women who work shifts and spend a lot of time in front of a computer screen and are less physically active. Similar results were found in a study conducted by [21]. It was found that women who work night shifts tend to have a higher risk of breast cancer. Disruption of the circadian rhythm due to night shifts is known to result in polymorphisms in the PER3 (Period Circadian Regulator 3) gene, which is associated with breast cancer. [22]. Low-income jobs affect the ability to pay for transportation to healthcare facilities, diagnostic tests, informal expenses, and sometimes even biopsies or mammograms. This can cause people to delay doctor visits. They may lack insurance or face full-out-of-pocket costs, delaying visits to the doctor or avoiding tests if symptoms are mild. [23]. Living in remote areas or areas with inadequate healthcare facilities may increase the risk of exposure to unhealthy environments or lifestyles. Chronic stress related to economic conditions can also impact health and immunity. [24].

Pharmacists play an essential role in supporting working women, especially those with limited income or who face access barriers to healthcare. They can provide flexible counseling services, including after-hours or mobile consultations, to accommodate patients with busy or shift-based work schedules. Pharmacists can also educate patients about the health risks associated with disrupted circadian rhythms and sedentary lifestyles, promoting preventive strategies such as stress management and physical activity. For patients with financial difficulties, pharmacists can guide them toward affordable medication options, such as generic alternatives, and inform them about available health assistance programs. By being accessible and proactive, pharmacists help ensure that working women receive consistent support and do not delay treatment due to financial or logistical barriers.

Clinical characteristics of breast cancer patients receiving tamoxifen therapy in a private hospital in **Central Java**

Understanding a patient's clinical characteristics has many benefits, including determining the appropriate treatment strategy, determining life expectancy, and predicting the success rate of therapy. Clinical variables examined include stage, comorbidities, and concomitant medications.

Based on the clinical characteristics in Table 2, the majority of patients were in advanced stages 143, 56.5%) of breast cancer. The high frequency of respondents with advanced stages and the predominance of patients under 50 are closely related. This is likely due to a lack of awareness of early symptoms, limited access to screening services, and the perception that breast cancer more often affects older women, leading younger patients to delay screening or treatment.[25]. Research conducted by a previous study [26] Showed similar results, as the majority of breast cancer patients were only diagnosed at stage III or IV, as most patients delayed treatment for more than six months. Late detection can lead to the development of advanced-stage disease in breast cancer patients.

In cases where breast cancer is diagnosed at an advanced stage, pharmacists play a critical role in optimizing treatment outcomes and supporting patients' quality of life. They can provide clear explanations of complex treatment regimens, manage drug interactions, and monitor side effects to improve tolerance to therapy. Pharmacists also play a role in promoting early detection by educating the community about breast cancer warning signs and the importance of early screening, especially during medication counseling or outreach programs. For patients who delayed treatment due to a lack of awareness, pharmacists can serve as a consistent, accessible source of information, helping build trust in the healthcare system and encouraging timely medical follow-up.

In this study, the majority of respondents (227, 89.7%) did not have comorbidities, likely because the study population was predominantly young patients. This can be a factor supporting the effectiveness of therapy, as no other diseases worsen the patient's condition. Comorbidities are common in patients with breast cancer, especially in older patients, increasing the risk factors for cancer. Breast cancer patients are also at higher risk of developing new chronic conditions, which affect treatment options, toxicity, survival, quality of life, and costs of care. [27]. The most common comorbidity suffered by patients in this study was hypertension (6.72%), followed by dyslipidemia (1.98%), then diabetes (1.19%), and finally epilepsy (0.40%).

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Previous studies have provided similar results, stating that the most common comorbidities are hypertension, dyslipidemia, diabetes, coronary heart disease, and stroke. [28–30].

Table 2. Clinical Characteristics

Clinical Characteristics		Freq. Percentage (%)
Stadium	early stage	110 (43.5%)
	advanced stage	143 (56.5%)
Comorbid	Hypertension	17 (6.72%)
	Dyslipidemia	5 (1.976%)
	Diabetes	3 (1.19%)
	Epilepsy	1 (0.40%)
	no comorbid	227 (89.72%)
Other Medicine	Amlodipine	13 (5.53%)
	Captopril	3 (1.19%)
	Metformin	2 (0.79%)
	Glimepiride	1 (0.395%)
	Simvastatin	4 (1.58%)
	Atorvastatin	1 (0.4%)
	Phenytoin	1 (0.4%)
	Diazepam	1 (0.4%)
	Diclofenac Sodium	3 (1.19%)
	Goserelin Acetate	8 (3.16%)
	No Other Medicine	215 (85%)

(a) Percentages are calculated from the total sample (N=253)
(b) The numbers will not add up to 100% because some patients are taking polypharmacy.

Pharmacists play a vital role in managing breast cancer patients with or without comorbidities. For patients without comorbidities, pharmacists can help maintain this status by promoting healthy lifestyle habits and regular health monitoring to prevent the development of chronic conditions during or after cancer treatment. For those with comorbidities like hypertension, diabetes, or dyslipidemia, pharmacists ensure safe and effective coordination of multiple therapies by reviewing for drug interactions, adjusting dosages, and monitoring side effects. They can also educate patients on the importance of medication adherence for both cancer and comorbid conditions, ultimately improving treatment outcomes, reducing complications, and supporting overall quality of life.

A history of other medication use was a common condition in patients in this study, related to their comorbidities. The majority of patients (85%) did not take any other medication besides tamoxifen, while 15% reported taking additional medications. The use of other medications based on comorbidities in this study included hypertension medications, namely amlodipine (5.53%) and captopril (1.19%); dyslipidemia medications, namely simvastatin (1.58%) and atorvastatin (0.40%); diabetes medications, metformin (0.79%) and glimepiride (0.40%); epilepsy medications, namely phenytoin (0.40); insomnia medications, namely diazepam (0.40%); pain medications, namely diclofenac sodium (1.19%), and finally goserelin acetate (3.16%). The use of other medications during tamoxifen therapy needs to be monitored because it can increase metabolic load, modify the side effect profile, such as increased toxicity, and accumulation of pharmacological side effects. Previous research has shown that polypharmacy can increase the severity of adverse drug reactions (ADRs) or lead to the emergence of new, unexpected ADRs. It can also decrease adherence due to severe side effects. For example, the use of potent SSRIs, which also have their own side effects (such as sleep disturbances, libido disturbances, etc.), worsens the patient experience. [31].

Pharmacists have a critical role in monitoring and managing drug use in breast cancer patients undergoing tamoxifen therapy, especially those using additional medications due to comorbidities. They are responsible for conducting thorough medication reviews to identify potential drug–drug interactions, overlapping side effects, and risks of toxicity. By doing so, pharmacists can help adjust regimens to reduce the risk of adverse drug reactions (ADRs) and improve treatment safety. They also play an essential role in

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educating patients about the importance of adherence, recognizing early signs of side effects, and ensuring proper timing and administration of multiple medications. Additionally, pharmacists can collaborate with physicians to deprescribe unnecessary drugs and simplify complex regimens, thereby reducing the burden of polypharmacy and improving patients' quality of life.

Conclusions

The profile of tamoxifen therapy use among breast cancer patients at two private hospitals in Central Java during July - September 2024 indicates that 253 patients were enrolled in the study. The study's results, based on sociodemographic characteristics, are dominated by patients aged <50 years (66%), low educational levels (65.2%), and workers (34.8%). Clinical characteristics are dominated by patients with advanced disease (56.5%), no comorbidities (89.7%), and not taking other medications (85%). These results cannot be generalized to the entire Central Java region due to the limitations of the study locations. To improve the generalizability of the results, future studies should include a broader range of healthcare facilities across various districts in Central Java, including urban, suburban, and rural areas. This can provide a more comprehensive and representative view of patient characteristics.

Conflict of Interest

This research was conducted independently and objectively using standard scientific methods, with data analysis conducted empirically without external intervention or conflicts of interest. Scientific integrity was maintained through thorough documentation and transparent analysis, with all findings based on valid evidence.

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