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ORIGINAL RESEARCH

Financial Toxicity and Its Associated Factors in Cancer Patients: A Cross-sectional Study in Indonesia

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Abstract

Background: Financial toxicity has been shown to negatively affect cancer patients' quality of life, depression, anxiety, and even mortality rates. However, there is only limited data on financial toxicity and its associated factors, which are needed to address this problem in Indonesia.
Purpose: This study aimed to identify factors associated with financial toxicity in cancer patients in Indonesia.
Methods: This study was a cross-sectional study that recruited respondents at a cancer health center in Indonesia using a convenience sampling method. A total of 110 adult cancer patients undergoing treatment took part in the study. The questionnaires comprised sociodemographic data, clinical characteristics, and the Comprehensive Score for Financial Toxicity (COST). Logistic regression was performed to achieve the study's aim.
Results: The median value of the financial toxicity index was 3.01 (min-max=1-5), indicating a medium level of financial toxicity. Occupational status was the only factor found to be associated with financial toxicity in this study. The participants who were unemployed were 2.389 more likely to have a higher financial toxicity level compared to those who were employed (OR=2.389; p=0.048).
Conclusion: Unemployment was identified to be associated with financial toxicity among cancer patients. Nurses should assess and assist patients in utilizing financial resources and develop strategies to manage extra costs that burden them financially. Future nationwide studies are essential to provide more robust evidence on multifaceted factors influencing financial toxicity and inform policy-making aimed at effectively addressing financial toxicity.

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1. Introduction

Cancer is one of the leading causes of death globally (Sung et al., 2021). According to the Global Cancer Observatory (Globocan), approximately 10 million deaths worldwide in 2020 were attributed to cancer (Sung et al., 2021). Globocan also reported 234,511 cancer-related fatalities in Indonesia, as well as 396,914 new cancer cases in 2020 (Sung et al., 2021). Moreover, based on a national health survey, there has been an increase in cancer prevalence in Indonesia, rising from 1.4 per 1,000 people in 2013 to 1.79 per 1,000 people in 2018 (Ministry of Health, Republic of Indonesia, 2018). These figures highlight the magnitude of cancer issue in Indonesia. The Ministry of Health of the Republic of Indonesia has also classified cancer as one of four catastrophic diseases, along with heart disease, stroke, and uro-nephrology, which urges prioritization of healthcare services in the country (Ministry of Health Republic of Indonesia, 2022).

One emerging phenomenon in cancer care worldwide is financial toxicity. Financial toxicity can be defined as the adverse impacts of the financial burden associated with cancer diagnosis and therapy on patients and their families (Desai & Gyawali, 2020). A systematic review describes that financial toxicity refers to the objective financial burden that arises from cancer care and the subsequent financial distress experienced by patients (Abrams et al., 2021). The financial burden can span from healthcare-related expenses and transportation to hospitals, as well as indirect financial strains owing to lost income during cancer trajectory (Fabian et al., 2023).

A growing number of evidence indicates the serious impact of financial toxicity on cancer patients. Financial toxicity causes not only psychological stress and treatment discontinuation but also a variety of other negative repercussions (Chan et al., 2019; Knight et al., 2018; Yousuf Zafar et al., 2015). Large-scale studies and systematic reviews have demonstrated the links between financial toxicity and reduced quality of life, increased cancer symptom manifestations, and even contributes to cancer-related mortality (Afiyanti et al., 2019; Perrone et al., 2016; Susilowati & Afiyanti, 2020; Xu et al., 2022).

The issue of financial toxicity was first raised in the United States, where cancer is the most expensive medical condition to treat, with the country's total spending on cancer services increasing by 39% from $125 billion in 2010 to $173 billion in 2020 (Mariotto et al., 2011). Subsequently, more studies found that financial issues among cancer patients are a global concern, extending to countries with universal healthcare coverage, such as Germany (Fabian et al., 2023) and Canada (Ezeife et al., 2019). In many countries, patients' out-of-pocket expenses for cancer treatment (those not covered by health insurance) have significantly increased recently (Desai & Gyawali, 2020).

A previous study conducted in ASEAN countries, including Indonesia, known as ASEAN Costs in Oncology (ACTION), found that the percentage of patients experiencing financial hardship one year after a cancer diagnosis is remarkably high at 48% % (Kimman et al., 2015). However, this study did not provide detailed information on the types of expenses that patients and their families must bear beyond government or private health insurance. Moreover, research on financial toxicity in Indonesian cancer patients is scant. A study in Jakarta, the capital of Indonesia that assessed risk-taking behaviors in 194 cancer patients suggested that the cancer patients experienced financial toxicity (Pangestu & Karnadi, 2018). A previous study focusing on Indonesian gynecological cancer patients also found that one of the patients' unmet primary needs was financial support and information regarding government financial assistance (Afiyanti et al., 2019). Another study conducted at a public hospital in Central Jakarta, Indonesia, assessed the financial toxicity of the breast cancer patient population recruited using consecutive sampling (Susilowati & Afiyanti, 2021). This study measured the financial toxicity and sociodemographic factors of breast cancer patients and found that the number of dependent and household income were correlated with financial toxicity (Susilowati & Afiyanti, 2021). Yet, those identified correlations cannot be generalized to other cancer patient population

Given the serious potential consequences of financial toxicity in cancer patients and the scarcity of information on the subjects in Indonesia, a study to examine financial toxicity in detail, including its most important influencing factors, is urgently needed. Previous investigations on the associated factors of financial toxicity have mostly been undertaken in developed countries, largely in the United States, as indicated in a recent robust meta-analysis (Ehsan et al., 2023). Ehsan's review (2023) highlighted that financial toxicity is more prevalent in lower- and middle-income countries/LMICs (78.8%) as opposed to 35.3% in high-income countries. However, the LMICs included in that review were only Iran, India, Haiti, and Kenya (Ehsan et al., 2023). As previously mentioned, previous studies in Indonesia are still limited in number and generalizability (e.g., Susilowati & Afiyanti, 2021, only focused on breast cancer patients). This current study added the study population into patients with all cancer types and the potential influencing factors of financial toxicity. Thus, this study aimed at identifying factors associated with financial toxicity in cancer patients.

2. Methods

2.1. Research design

This study employed a cross-sectional design. This study design is appropriate to determine influencing factors of the studied phenomenon at the one time point. The focus of this study was the financial toxicity of Indonesian cancer patients. Cross-sectional studies are suitable to examine the prevalence of a condition or trait and its association with other factors (Kesmodel, 2018).

2.2. Setting and samples

Participants were recruited from a National Cancer Center, in Jakarta, Indonesia, using a convenience sampling strategy. This hospital is a comprehensive cancer center that provides leading-edge cancer treatments for patients from across Indonesia. Its services encompass cancer

prevention, clinical services, and research. This hospital serves around 1,000 patients in the outpatient unit every day. Meanwhile, its inpatient units have 350 beds, which are normally 90% occupied. In this study, the inclusion criteria were patients: 1) aged 18 years or older; 2) being diagnosed with cancer; 3) undergoing any cancer treatment (e.g., chemotherapy, hormonal therapy); and 4) willing to participate in the study. Patients were excluded if they had an altered level of consciousness or mental status that would hinder them from completing the questionnaires. Sample size calculation was conducted using G*Power 3.1 (Faul et al., 2009). A sample size of 110 participants was needed to yield a power of 0.80 to detect an effect size = 0.162 (Susilowati & Afiyanti, 2021) at alpha = 0.05 (two-tailed).

2.3. Measurement and data collection

This study used a set of questionnaires comprising sociodemographic characteristics and the Indonesian version of the Comprehensive Score for Financial Toxicity (COST). The sociodemographic characteristics were categorized into two for the bivariate and multivariate analyses. The sociodemographic variables were categorized as follows: 1) age (*a*. ≥18-55 years old *or b*. >55 years old); 2) marital status (*a*. married *or b*. not married: single, widowed/ divorced); 3) education (*a*. *low*: did not complete elementary school, elementary school, junior high school *or b*. *high*: senior high school, university/college); 4) occupational status (*a*. employed *or b*. unemployed (including housewife and quit working); 5) monthly family income (*a. low*: IDR <2.9 million; IDR 2.9-4.33 million *or b*. *high*: ≥ IDR 4.33 million); 6) number of hospital visits (*a*. ≤ 2 *or b*. >2); 7) breadwinner (*a*. myself *or b*. my spouse/partner/relatives/ other); 8) cancer type (*a. gynecological:* endometrial, cervical, ovarian cancer *or b*. *non-gynecological*: breast, lung, bone, other cancer); 9) cancer stage (*a*. *early:* stage 0-1, 2-3 *or b*. late stage: stage 4); 10) cancer therapy (*a*. surgery/hemotherapy/radiation *or b*. combination); 11) health financing (*a*. National Social Security Agency on Health/*Badan Penyelenggara Jaminan Sosial-BPJS or b*. non-BPJS); 12) communication with health care providers regarding financial issues (*a*. yes *or b*. no); 13) indirect costs (*a*. transportation *or b*. other (accommodation and other)); 14) number of dependent (*a*. ≤ 2 *or b*. > 2); and 15) distance from the hospital (*a*. near ≤36.5 km *or b*. far >36.5 km).

The COST questionnaire was originally developed by de Souza et al. (2014) in a group of 155 patients with stage IV cancer receiving chemotherapy in the United States. They validated the instrument in 233 patients with the same characteristics and demonstrated the COST's excellent internal consistency (Cronbach's alpha of 0.92) and test-retest reliability (intra-class correlation of 0.80; 95% confidence interval, 0.57-0.92). The results of factor analyses showed that the COST possessed a coherent, single, latent factor, that is the financial toxicity (de Souza et al., 2017). These results suggest that the COST is a valid and reliable tool to measure cancer patients' financial toxicity in relation to cancer treatments (de Souza et al., 2017).

The COST measure consists of 11 items with a 5-point Likert scale ranging from "completely disagree" (1) to "completely agree" (5) (de Souza et al., 2014). The average of the scores was calculated to get an index value. The COST's index values closer to 5 indicate worse financial toxicity (de Souza et al., 2014). The internal consistency of the Indonesian version of the COST questionnaire is good (Cronbach's alpha = 0.895) (Susilowati & Afiyanti, 2021).

The researcher was assisted by staff nurses from the National Cancer Center in approaching and recruiting potential participants at the outpatient and one-day care units in October 2023. After providing written informed consent, participants filled out the paper-based questionnaire. The research team accompanied the participants while completing the questionnaire to answer any emerging questions and check the completeness of their responses.

2.4. Data analysis

Descriptive statistics were performed to analyze the sociodemographic characteristics according to the financial toxicity levels of the participants. The median value of 3.01 for the financial toxicity index was used as a cut-off point to categorize higher and lower levels of financial toxicity in this study. A median split was used due to the heavy-tailed distributions of the financial toxicity values. Then, the significant sociodemographic data were analyzed against the financial toxicity level using Chi-square analysis and multivariate analysis with logistic regression. SPSS version 25 (SPSS Inc., Chicago, IL., USA) was used for the statistical analysis.

2.5. Ethical considerations

Ethical clearance for this study was obtained from the Institutional Review Board of the Dharmais National Cancer Center (No. 080/KEPK/II/2023). The ethical principles outlined in the Declaration of Helsinki were adhered to throughout the research process. All participants were given sufficient information regarding the study objectives, procedures, potential risks and benefits, and their rights as participants prior to signing the consent. Data were kept anonymous and confidential to fulfill ethical considerations. Data were only labeled with a number, and to maintain confidentiality, the researcher kept the data for approximately five years, and the detailed data will only be used for analysis in the study.

3. Results

3.1. Participants' characteristics

A total of 110 participants completed the questionnaires. The majority of the participants were aged 18 to 55 years or older (61.8%), married (83.6%), and had completed senior high school (41.8%). Notably, most participants (70.9%) were unemployed, either as housewives or had quit their jobs due to their illness. Almost half of the participants (49.1%) had a monthly family income of 2.9-4.33 million rupiahs, which can be considered low for covering living expenses in most regions of Indonesia. Furthermore, the most frequent cancer diagnosis among the participants was breast cancer (42.7%) at stages 2-3 (61.8%). Nearly all participants used government insurance, namely the National Social Security Agency on Health, to cover their healthcare expenses. However, the majority of them (80%) still had to pay out of their own pockets for transportation to and from the hospital. Table 1 provides a complete overview of the participants' sociodemographic and clinical characteristics. Meanwhile, the median value of the financial toxicity index was 3.01 (min-max: 1-5), indicating that, on average, the participants reported a medium level of financial toxicity (Table 1).

Table 1. Participants' characteristics (n=110)

Characteristics	f	%
Age		
≥18-55 years old	68	61.8
>55 years old	42	38.2
Marital status		
Single	8	7.3
Married	92	83.6
Widowed/divorced	10	9.1
Education		
University/college	30	27.3
Senior high school	46	41.8
Junior high school	21	19.1
Elementary school	12	10.9
Did not complete elementary school	1	0.9
Occupational status		
Employed	32	29.1
Unemployed (housewife/quit working)	78	70.9
Monthly family income		
≥ IDR 4.33 million	18	16.4
IDR 2.9-4.33 million	54	49.1
IDR < 2.9 million	38	34.5
Number of hospital visits apart from cancer treatment		
≤ 2	72	65.5
> 2	38	34.5
Breadwinner		
Myself	33	30.0
My spouse/partner/relatives/other	77	70.0

Table 1. Continued

Characteristics	f	%
Cancer type		
Breast cancer	47	42.7
Endometrial cancer	2	1.8
Lung cancer	6	5.5
Cervical cancer	12	10.9
Ovarian cancer	2	1.8
Bone cancer	1	0.9
Other	40	36.4
Cancer stage		
Stage 0-1	14	12.7
Stage 2-3	68	61.8
Stage 4	26	23.6
Unknown	2	1.8
Cancer therapy		
Surgery	10	9.1
Chemotherapy/Radiation	52	47.3
Combination	48	43.6
Health financing		
National Social Security Agency on Health *(BPJS)*	108	98.2
Private insurance	1	0.9
Out-of-pocket	1	0.9
Communication with healthcare providers regarding financial issues		
Yes	75	68.2
No	35	31.8
Indirect costs		
Transportation	88	80.0
Accommodation	14	12.7
Other	8	7.3
Number of dependent		
≤ 2	54	49.1
> 2	55	50.0
None	1	0.9
Financial toxicity index (Median: 3.01; Min-max: 1-5)		

In this study, the relationship between sociodemographic and financial toxicity levels was assessed using Chi-square analysis. The results are presented in Table 2.

Table 2. Relationship between participants' characteristics and financial toxicity (n=110)

Characteristics	Financial Toxicity		Total	OR (95%CI)	*p*
	≤ 3.01	>3.01			
	f (%)	f (%)	f (%)		
Age					
≤18-55	39 (42.6)	39 (57.4)	68 (100)	0.614 (0.28;1.33)	0.216
>55	23 (54.8)	19 (45.2)	42 (100)		
Marital status					
Not married	5 (62.5)	3 (37.5)	8 (100)	1.950 (0.44;8.59)	0.370
Married	47 (46.1)	55 (53.9)	102 (100)		
Education					
High	36 (47.4)	40 (41.3)	76 (100)	0.495 (0.41;0.59)	0.976
Low	16 (47.1)	18 (52.9)	34 (100)		
Occupational status					
Employed	20 (62.5)	12 (37.5)	32 (100)	2.396 (1.02;5.58)	0.040*
Unemployed	32 (41.0)	46 (59.0)	78 (100)		
Income					
High	10 (55.6)	8 (44.4)	18 (100)	1.488 (0.53;4.11)	0.442
Low	42 (45.7)	50 (54.3)	92 (100)		

Table 2. Continued

Characteristics	Financial Toxicity		Total	OR (95%CI)	*p*
	≤ 3.01	>3.01			
	f (%)	f (%)	f (%)		
Number of hospital visits apart from cancer treatment					
≤2	37 (51.4)	35 (48.6)	72 (100)	1.621 (0.73;3.60)	0.234
>2	15 (39.5)	40 (60.5)	38 (100)		
Breadwinner					
Myself	17 (51.5)	16 (48.5)	33 (100)	1.275 (0.56;2.88)	0.560
My spouse/partner/relatives/other	35 (45.5)	42 (54.5)	77 (100)		
Cancer type					
Gynecological	26 (41.3)	37 (58.7)	63 (100)	0.568 (0.26;1.2)	0.144
Non-Gynecological	26 (55.3)	21 (44.7)	47 (100)		
Cancer Stage					
Early stage	11 (68.8)	5 (31.3)	16 (100)	2.844 (0.91;8.83)	0.063
Late stage	41 (43.6)	53 (56.4)	94 (100)		
Cancer therapy					
Surgery/ Chemotherapy/ Radiation	27 (43.5)	35 (56.5)	62 (100)	0.710 (0.33;1.51)	0.374
Combination	25 (52.1)	23 (47.9)	48 (100)		
Health financing					
National Social Security Agency on Health *(BPJS)*	52 (48.1)	56 (51.9)	108 (100)	0.519 (0.43;0.62)	0.497
Non-*BPJS*	0 (0%)	2 (100%)	2 (100)		
Communication with healthcare providers					
Yes	38 (50.7)	37 (49.3)	75 (100)	1.541 (0.68;3.47)	0.297
No	14 (40)	21 (60)	35 (100)		
Indirect cost					
Transportation	42 (47.7)	46 (52.3)	88 (100)	1.096 (0.42;2.79)	0.849
Transportation and else	10 (45.5)	12 (54.5)	22 (100)		
Number of dependents					
<2	25 (46.3)	29 (53.7)	54 (100)	0.866 (0.42;1.78)	0.697
>2	26 (47.3)	29 (52.7)	55 (100)		
None	1 (100)	0 (0)	1 (100)		
Distance					
Near	47 (49)	49 (51)	96 (100)	1.727 (0.53;5.53)	0.354
Far	5 (35.7)	9 (64.3)	14 (100)		

Notes. *Significant, $p<0.05$

3.2. Factors associated with financial toxicity

Bivariate selection with Chi-square analysis was performed to select variables that affect financial toxicity ($p<0.25$). After bivariate selection, five variables (age, occupational status, number of hospital visits, cancer type, and cancer stage) were included in the logistic regression (Table 3).

The logistic regression test would be excluded gradually starting from the variable with the largest *p*-value. The first excluded variables were age, cancer type, and cancer stage. When excluding the variables of number of hospital visits and type of cancer, the *p*-value of the core variables changed so that the variables of number of hospital visits and type of cancer were still included. Occupational status, number of hospital visits, and cancer type were identified as factors associated with financial toxicity in this study. Furthermore, potential covariates that might confound the relationships between our independent and dependent variables were analyzed. A confounding test analysis was conducted to determine the presence of potential confounders that could affect the relationship between factors that influence financial toxicity.

The confounding factor was determined from the difference in OR values before and after each of the variables was excluded. If the difference in OR value is >10%, then the variable is a confounding factor in the relationship between employment status and financial toxicity, and we found no confounders (Table 4).

Table 3. Initial model in regression analysis (n=110)

Variables	Coefficient	S.E	Wald	df	*p*	OR	CI 95%	
							Min	Max
Constant: -2.004								
Occupational status								
Employed	0.717	0.465	2.379	1	0.123	2.047	0.824	5.089
Unemployed								
Age								
≤18-55	-0.310	0.448	0.478	1	0.489	0.734	0.305	1.765
>55								
Number of hospital visits								
≤2	0.581	0.431	1.818	1	0.178	1.788	0.768	4.159
>2								
Cancer type								
Gynecological	-0.354	0.446	0.630	1	0.427	0.702	0.293	1.682
Non- Gynecological								
Cancer stage								
Early stage	0.561	0.632	0.787	1	0.375	1.752	0.508	6.049
Late stage								

Table 4. Confounding analysis

Independent variable	Confounding potential	OR		ΔOR
		Before	After	
Occupational status	Number of hospital visits	2.389	2.304	8.5%
	Cancer type	2.389	2.486	9.7%

*as confounding factors

The final model demonstrated that participants who were unemployed were 2.389 times more likely to have a higher financial toxicity level compared to those who were employed (OR = 2.389; p=0.048). The number of hospital visits and cancer type yielded insignificant p-values (p<0.05). It means that we cannot conclude that these variables affect financial toxicity.

Table 5. The final model of the logistic regression

Variables	Coefficient	SE	Wald χ^2	*p*	OR	95% CI	
						Min	Max
Constant = -1.368							
Occupational status							
Employed	0.871	0.441	3.901	0.048*	2.389	1.007	5.668
Unemployed							
Number of hospital visits							
≤2	0.588	0.424	1.926	0.165	1.801	0.785	4.134
>2							
Cancer type							
Gynecological	-0.559	0.402	1.933	0.164	0.572	0.260	1.257
Non-Gynecological							

* Significant at p<0.05

4. Discussion

This study aimed to identify factors associated with financial toxicity in cancer patients. It revealed that cancer patients undergoing therapy experienced a medium level of financial toxicity. Notably, this value was lower than that reported in a recent study of Indonesian breast cancer patients (Susilowati & Afiyanti, 2021). The lower median financial toxicity index was influenced by sample variation related to the study site being selected as a national cancer referral center, which allows for variable sample conditions. In contrast, previous studies among head and neck cancer patients in the United States indicated a high prevalence of financial toxicity (Beeler et al., 2020; Mady et al., 2019). Furthermore, a survey of patients with multiple myeloma who had

insurance found that 71% of patients experienced financial burdens due to treatment and additional costs not covered by insurance (Huntington et al., 2015). In the current situation in Indonesia, the government only covers cancer treatment costs while other costs, such as accommodation, have not been covered, resulting in unmet needs, especially finding about financial support and government benefits (Afiyanti, 2019). Recent meta-analysis on financial toxicity among cancer patients in lower and middle-income countries (LMICs) reported that more than half (56.96%; 95%CI, 30.51-106.32) of cancer patients experienced objective financial toxicity measured by the total amount of direct and indirect medical costs and non-medical costs, spent by the cancer patients (Donkor et al., 2022). Importantly, financial toxicity was not limited to LMICs; it also affected cancer patients in high-income countries (HICs) with publicly funded healthcare systems, such as Canada, the United Kingdom, Germany, Australia, Finland, the Netherlands, and South Korea (Longo et al., 2020). Variations between countries, even among developing countries, might occur due to the varied health financing system and capacity, daily living costs (including transportation, meals, and housing), and the financial status of the people in the respective countries.

Another significant finding of this study was that occupational status was the sole influencing factor significantly associated with financial toxicity among the study participants. This finding appeared to diverge from prior research results, including those summarized in several meta-analyses on financial toxicity. A meta-analysis by Donkor et al. (2022) concluded that the financial toxicity level was higher in cancer patients undergoing multiple cycles of chemotherapy, those from larger households (more than four members), and those receiving treatment at private health facilities. Similarly, a scoping review of cancer treatment-related financial toxicity in LMICs also found that lower socioeconomic status and lack of insurance were associated with a higher level of financial toxicity (Udayakumar et al., 2022). In HICs with universal health coverage, financial toxicity was more likely to affect cancer patients with more severe cancer types and those in the early stages of their disease trajectory (Longo et al., 2020). Employment status in cancer patients certainly affects total income, and often, the cancer, in certain situations, makes it difficult for patients to remain employed, and the chance of no longer working is even higher. Reduced income and some office-related insurance are factors that trigger financial toxicity.

However, our finding regarding occupational status remained relevant to a previous study focused on breast cancer patients in Indonesia, suggesting that the position of the wage earner influenced financial toxicity (Susilowati & Afiyanti, 2021). In the context of that study, the participants were exclusively women who were financially dependent on their spouse, partner, and other family members. While our study included cancer patients regardless of their diagnosis and gender, the majority of our participants were housewives relying on their husband's income. Some participants in this study also gave up their jobs due to their cancer and lengthy treatment periods. Although our participants mentioned that their treatments were primarily covered by national insurance, they still incurred substantial expenses for transportation to the hospital, which was located in Jakarta, the capital city of Indonesia. Some participants were referred from smaller regions in Indonesia with inadequate healthcare facilities for cancer patients, requiring them to rent accommodations near the hospital and cover daily living expenses in Jakarta, which is more expensive than in other regions in Indonesia. Longo et al. (2020), in their systematic review, also found that out-of-pocket costs, including travel expenses, were the most common and significant burden related to cancer, as observed from the perspectives of both cancer patients and caregivers.

In addition, our study results were relatively consistent with the findings of several studies conducted in HICs. A Dutch study analyzing its national registry revealed a connection between unemployment and financial toxicity among long-term cancer survivors (Pearce et al., 2019). Pearce et al. (2019) reported that participants without paid employment were more likely to report financial toxicity, with no significant difference observed between working and non-working patients. Another study among American cancer survivors, based on a nationally representative sample, indicated that unemployment or loss of income and low baseline income were associated with financial toxicity (Yabroff et al., 2016). The findings from the Netherlands, with its publicly funded healthcare system, and the United States, with its user-pays healthcare system, suggest that unemployment is a universal risk factor for financial toxicity. Nevertheless, a systematic review demonstrated that a larger proportion of American cancer patients reported

financial toxicity, highlighting the significant burden faced by patients in a healthcare system lacking universal coverage (Altice et al., 2017).

The cancer type variable does not show a statistically significant effect on financial toxicity. Financial toxicity can occur in all types of cancer. This is in accordance with a previous study (Pangestu & Karnadi, 2018). The number of hospital visits did not have a statistically significant effect on financial toxicity, but the higher frequency of visits will affect the amount of costs incurred by each patient (Souza et al., 2014).

5. Implications and limitations

This study emphasizes the importance of nurses including financial well-being as a part of the holistic assessment of cancer patients, particularly those who are unemployed or working as housewives. This assessment is especially crucial at significant milestones in the cancer journey, such as after diagnosis and primary treatment. Nurses should integrate financial assessment and support into the nursing care plan, even during long-term follow-up. Nurses can educate and assist patients in utilizing financial resources and developing strategies to manage the additional costs that create financial burdens. Furthermore, nurses can collaborate with patient navigators or social workers who possess specialized knowledge about financial assistance programs and community resources.

The present study, however, has several limitations. It was a single-centered cross-sectional study, limiting the generalizability of the findings. Additionally, this study only assessed subjective financial toxicity, which might be susceptible to biases such as social desirability and recall biases. The financial toxicity problem among cancer patients in Indonesia warrants a larger, preferably nationwide, longitudinal study with a more comprehensive examination that encompasses objective financial toxicity (actual reports of the financial costs incurred by the patients) and additional financial support, as well as the determinants and impacts of financial toxicity.

6. Conclusion

The study results lead to the conclusion that financial toxicity is a prevalent issue among cancer patients at the National Cancer Center in Indonesia. Patients without employment face a higher risk of experiencing elevated levels of financial toxicity. These findings contribute further evidence to the significance of addressing employment-related issues in the context of financial toxicity. Future research with a nationally representative sample size encompassing more comprehensive aspects of health financing and patients' multidimensional factors should be conducted to address the financial toxicity problem in cancer patients in Indonesia.

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Author contribution

DH conceptualized the study, conducted data collection and analysis, and wrote the first draft of the manuscript. YA conceptualized the study, supervised data collection and analysis, and contributed to manuscript drafting.

Conflict of interest

No conflict of interest related to this study.

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