Clinical Research

Treatment delay of cancer patients in Indonesia: a reflection from a national referral hospital

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ABSTRACT

BACKGROUND Cancer is a complex disease requiring a multidisciplinary approach in establishing prompt diagnosis and treatment. Treatment in a timely manner is crucial for the outcomes. Hence, this study aimed to provide information on treatment delay including patient and provider delays and its associated factors.

METHODS Cancer patients were recruited conveniently in the outpatient clinic of Department of Radiation Oncology, Cipto Mangunkusumo Hospital, Indonesia between May and August 2015. All patients were asked to fill a questionnaire and interviewed in this cross-sectional study. Treatment delay was explored and categorized into patient delay and provider delay. Patient delay could be happened before (patient-delay-1) or after (patient-delay-2) the patient was diagnosed with cancer. Provider delay could be due to physician, system-diagnosis, and system-treatment delays.

RESULTS Among 294 patients, 86% patient had treatment delay. Patient delay was observed in 153 patients, and 43% of them had a history of alternative treatment. An older age (p = 0.047), lower educational level (p = 0.047), and history of alternative treatment (p<0.001) were associated with patient delay. Meanwhile, 214 patients had provider delay, and 9%, 36%, and 80% of them experienced physician, system-diagnosis, and system-treatment delays, respectively. All types of provider delay were associated with patient delay (p<0.001).

CONCLUSIONS Most of the patient had treatment delay caused by either patient or provider.

KEYWORDS cancer, Indonesia, treatment delay

Cancer is a disease with a continual increase in morbidity and mortality rates, indicating that cancer has become a major and complex health problem.[1–3] Moreover, cancer causes a decrease in the quality of health, productivity, and economic status of patients and family, the community, and eventually, a country.[4]

Data from the Ministry of Health of the Republic of Indonesia show that cancer is one of the country's highest health expenditures.[5] This high expenditure is partly due to workloads and modalities used to treat cancer, especially if treatment is carried out at an advanced stage. Due to its complexity, a multidisciplinary approach is needed to get a definitive treatment and reduce duration in establishing the diagnosis. It is crucial to speed up the establishment of cancer staging to avoid the upstaging of the disease and increase clinical judgment based on evidence-based practice.[6,7]

The Union for International Cancer Control stated that 43% of all cancer cases can be prevented with a

healthy lifestyle, and 30% can be cured if managed at early stage.[8] Reducing treatment delay will eventually have a significant economic impact. All stakeholders should be aware of factors influencing cancer treatment delay to reduce the delay.[9]

A study showed that 12 weeks of treatment delay unfavorably affected the prognosis.[10] Another study in Asia indicated that >6 months of treatment delay resulted in poorer disease-free survival.[11] There was a lack of data on cancer treatment delay in Indonesia. Thus, this research was conducted to present data of treatment delay including patient and provider delays.

METHODS

This was a cross-sectional study to determine the prevalence of treatment delay in cancer patients referred to the outpatient clinic in the Department of Radiation Oncology at Cipto Mangunkusumo Hospital between May and August 2015. The inclusion criteria were all new patients who were consulted to the Department of Radiation Oncology and were diagnosed with malignancy and insured by the *Badan Penyelenggara Jaminan Sosial Kesehatan* (a national health insurance system in Indonesia). Patients with recurrent, benign tumor, and incomplete medical records were excluded.

Subjects were recruited conveniently during clinic hours. Data were obtained from the questionnaire and structured interviews after obtaining informed consent from the patients who met the inclusion criteria. The questionnaire contains the patient's demographic and socioeconomic condition, history of the disease, history of alternative treatment, and diagnosis and treatment of cancer. A deeper interview was conducted on some patients who experienced treatment delay.

Treatment delay was classified into patient delay and provider delay. Patient delay was attributed to patients who delayed seeking medical attention.[12] Subject was considered to have patient-delay-1 if the duration from the patient had the first symptom to the first medical consultation was >90 days. Moreover, subject would have patient-delay-2 if the duration from the diagnosis establishment to definitive treatment (surgery, chemotherapy, or radiation) was >90 days. Provider delay was classified into physician delay and system delay. Physician delay was defined as a delay in referral of >30 days from the first medical consultation to a specialist or healthcare provider in a referral hospital that could perform a diagnostic procedure. System delay was classified into system-diagnosis delay (from first visit to specialist or referral hospital to diagnose cancer in >30 days) and system-treatment delay (from cancer diagnosis to first definitive treatment in >30 days) (Figure 1).

Sample size was estimated using the formula for two independent proportions with a 95% confidence interval (CI), significance level of 0.05, and 80% power. By assuming a 10% difference among both

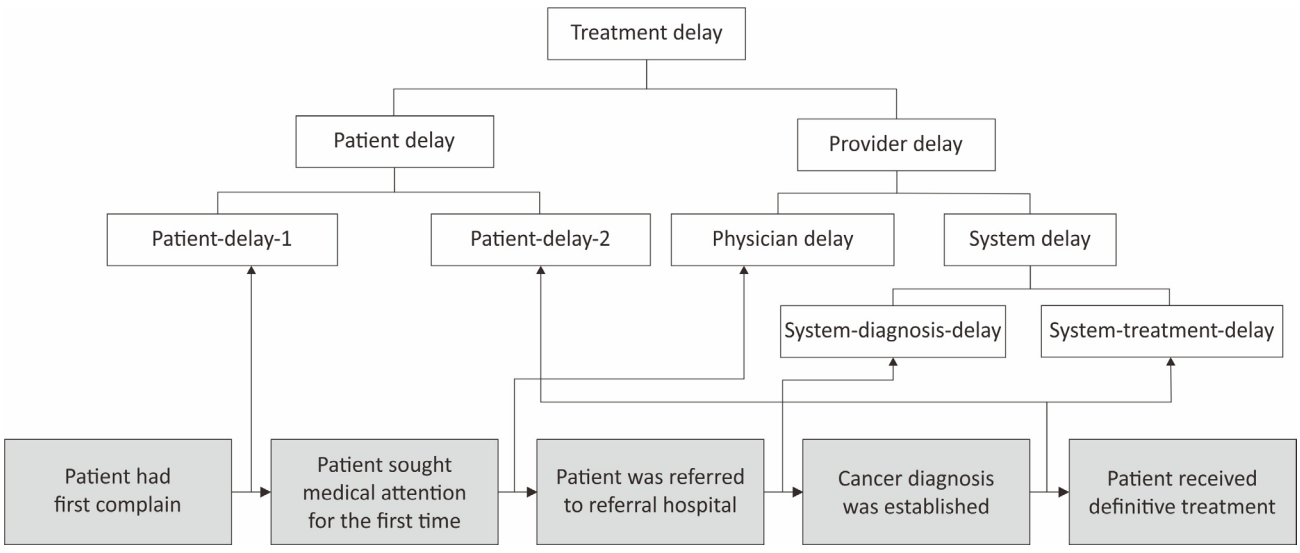

Figure 1. Classification of treatment delay

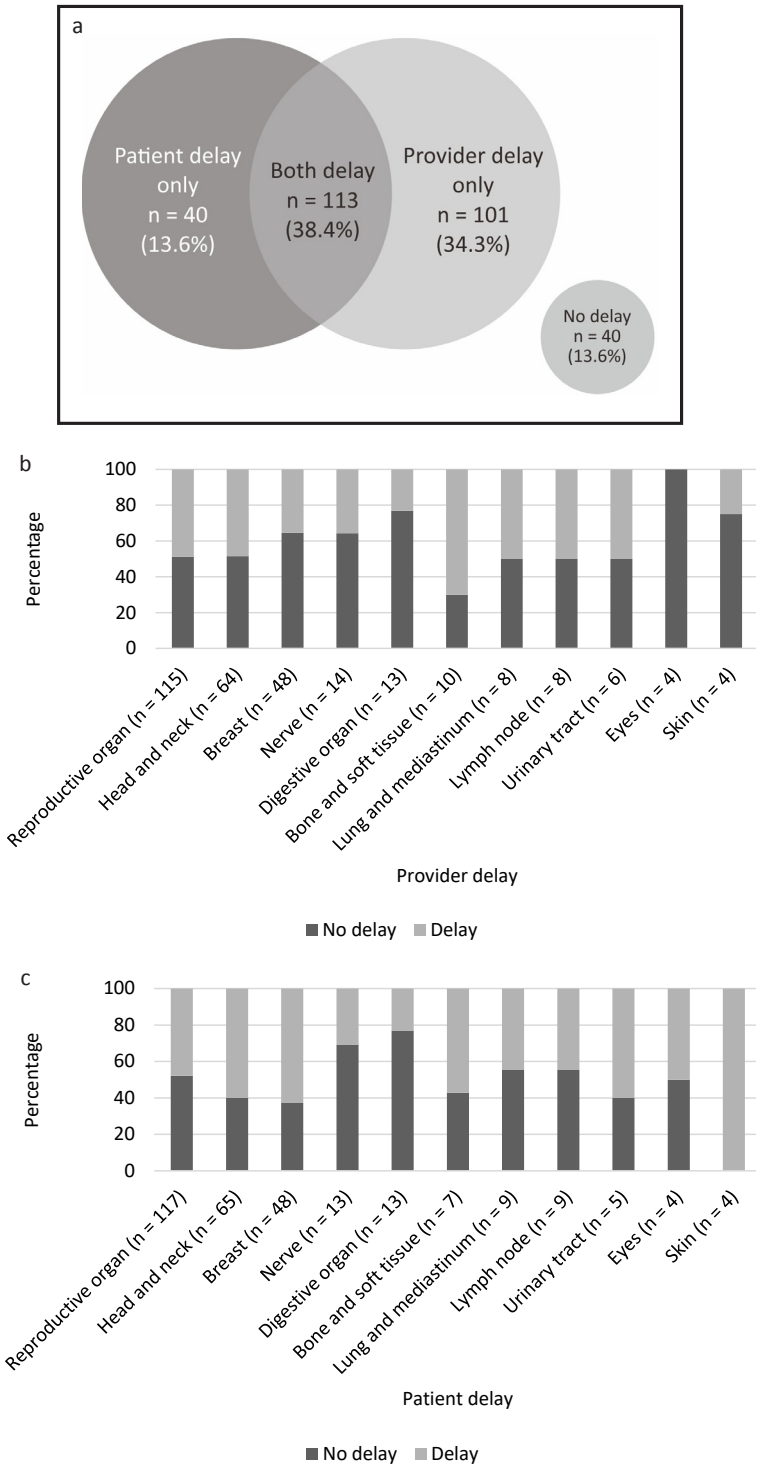

Figure 2. Frequency of treatment delay based on type of the delay (a) and primary cancer site (b and c)

proportions, a minimum of 384 samples was needed. Data entry and coding were performed using Microsoft Office Excel (Microsoft, USA) and SPSS version 20.0 (IBM Corp., USA). Statistical analysis was performed using univariate analysis to know the relationship between factors related to patient and provider delays. Association between age, education, distance from residence to the nearest health service (>15 km), alternative treatment use, and provider delay and patient delay were analyzed using chi-squared test. Moreover, we provided the relative risk within the tables for each delay analyzed. Data were presented in the form of text, tables, and graph. Ethical clearance was obtained

Table 1. Characteristics of the subjects

Characteristic	n (%) (N = 294)
Male sex	84 (28.6)
Age (years)	
≤17	12 (4.1)
18–35	34 (11.5)
36–50	132 (44.9)
51–65	99 (33.7)
>65	17 (5.8)
Marital status	
Married	270 (91.8)
Unmarried	24 (8.2)
Residency	
Jakarta	117 (39.8)
Outside Jakarta	177 (60.2)
Education	
None	14 (4.7)
Primary school	70 (23.8)
Junior high school	77 (26.2)
Senior high school	74 (25.2)
University (Diploma)	40 (13.6)
University (Bachelor)	19 (6.5)
Occupation	
Unemployed	27 (9.2)
Housewife	141 (48.0)
Self-employed	15 (5.1)
Private employee	81 (27.5)
Driver	12 (4.1)
Retired	5 (1.7)
Others*	13 (4.4)
Type of cancer and staging	
Cervical cancer (N = 108)	
IB1+2	6 (5.6)
IIA+B	29 (26.8)
IIIA	2 (1.9)
IIIB	61 (56.5)
IVA	9 (8.3)
IVB	1 (0.9)
Breast cancer (N = 46)	
IIA+B	15 (32.6)
IIIA	12 (26.1)
IIIB	15 (32.6)
IIIC	4 (8.7)
Nasopharyngeal cancer (N = 31)	
II	4 (12.9)
III	11 (35.4)
IVA	6 (19.5)
IVB	10 (32.3)

*Others are graphic designer, cook, cashier, notary, nurse, farmer, laborer

from the Ethics Committee of the Faculty of Medicine Universitas Indonesia with ethical approval (No: 1114/UN.2.F1/ETIK/2015).

RESULTS

From 294 patients recruited in this study, treatment delay was observed in 254 (86%) of patients. Among them, 153 patients had patient delay, 214 patients had provider delay, and 113 patients experienced both patient and provider delays (Figure 2a). The history of alternative treatment was observed in 67 patients. Patients who did not have treatment delay never sought alternative treatment.

Figure 2b shows the distribution of treatment delay based on cancer primary sites. Three of the most common cancer type were cervical, breast, and nasopharyngeal cancers (Table 1). Approximately 47.0% of patients with cervical cancer experienced delay in treatment, with stage IIIB as the most common stage. For breast cancer patients who experienced delay, 48.3% were diagnosed with stage IIIB. The most common stage in nasopharyngeal cancer patients who experienced treatment delay was stage IVB, followed by stage III. The result implies that most of the delay was observed in a higher cancer stage patients.

Patient delay

Of 153 patients, 126, 39, and 12 had patient-delay-1, patient-delay-2, and both patient-delay-1 and patient-delay-2, respectively. There were several factors that might influence patient delay (Table 2). The age group of population with the most delay was between 36 and 50 years (49.7%). A treatment delay was more prevalent among junior high school (28.8%) and primary school (27.5%) graduates. Furthermore, there were similar proportions between patients with and without a treatment delay in patients who lived near the hospital.

About 22.8% of the patients had previously sought alternative treatment, with 32.8% of them were primary school graduates, and 26.9% were junior high school graduates.

This study found various reasons of treatment delay. In patient-delay-1, three of the most common reasons were a lack of knowledge, preference for alternative treatment, and reluctance to seek medical advice. In a patient-delay-2, the most common reason was the preference for alternative treatment (Table 3).

Table 2. Factors associated with treatment delay in cancer patients

	Delay, n (%) (N = 153)	No delay, n (%) (N = 141)	Total, n (%) (N = 294)	*p**	RR (95% CI)
Age (years)				**0.047**	
>65	11 (64.7)	6 (35.3)	17 (5.8)		3.88 (1.04–14.43)
51–65	52 (52.5)	47 (47.5)	99 (33.7)		3.15 (0.88–11.32)
36–50	76 (57.6)	56 (42.4)	132 (44.9)		3.46 (0.97–12.35)
18–35	12 (35.3)	22 (64.7)	34 (11.6)		2.12 (0.55–8.12)
≤17	2 (16.7)	10 (83.3)	12 (4.1)		1.00
Education				**0.047**	
No education	6 (42.9)	8 (57.1)	14 (4.7)		1.63 (0.62–4.28)
Primary school	42 (60.0)	28 (40.0)	70 (23.8)		2.28 (1.05–4.96)
Junior high school	44 (57.1)	33 (42.9)	77 (26.2)		2.17 (1.00–4.72)
Senior high school	37 (50.0)	37 (50.0)	74 (25.2)		1.90 (0.87–4.17)
Diploma degree	19 (47.5)	21 (52.5)	40 (13.6)		1.81 (0.80–4.10)
Bachelor's degree	5 (26.3)	14 (73.7)	19 (6.7)		1.00
Distance from residence to the nearest health service (km)				0.224	
>30	18 (69.2)	8 (30.8)	26 (8.8)		1.39 (1.03–1.89)
15–30	64 (51.2)	61 (48.8)	125 (42.2)		1.03 (0.81–1.31)
<15	71 (49.7)	72 (50.3)	143 (48.6)		1.00
Alternative treatment				**<0.001**	
Yes	67 (100.0)	0 (0)	67 (22.8)		2.64 (2.24–3.12)
No	86 (37.9)	141 (62.1)	227 (77.2)		

CI=confidence interval; RR=relative risk
The delay investigated was patient-attributable delay; *chi-squared test

Table 3. Reasons for patient delay

Reasons for the delay	Patient-delay-1 n (%) (N = 126)	Patient-delay-2 n (%) (N = 39)
Lack of knowledge	110 (87.3)	6 (15.4)
Had no medical expenses	10 (7.9)	3 (7.7)
Reluctance to seek medical advice	30 (23.8)	19 (48.7)
Preference for alternative treatment	39 (30.9)	28 (71.8)
Distance to nearest hospital	6 (4.8)	0 (0)
Complex BPJS policies	2 (1.6)	6 (15.4)
Others	1 (0.8)	2 (5.1)

BPJS=*Badan Penyelenggara Jaminan Sosial* (a national health insurance system in Indonesia)
One respondent may have more than one reason

Only history of alternative treatment ($p<0.001$) was associated with treatment delay. The age, education level, and distance from residence to the nearest health service had no significant effect on treatment delay.

Provider delay

Provider delay was observed in 214 patients. Of 214 patients, 18, 78, and 172 patients experienced physician, system-diagnosis, and system-treatment delays, respectively. A median time interval of 120 days (range, 100–125 days) from the first time a patient sought a medical consultation to receiving a definitive cancer treatment was obtained. Of 294 patients, 62 were referred from a primary health care provider. The provider delay was mostly attributed to system-treatment delay (41.1%), followed by both system-diagnosis and system-treatment delays (14.6%), system-diagnosis delay (10.9%), physician delay (2.7%), both physician and system-treatment delays (2.3%), and both physician and system-diagnosis delays (0.7%). Still, 0.4% of patients experienced delay in all stages of provider delay. Only 80 patients did not experience provider delay at all (27.3%).

Among 78 patients with system-diagnosis delay, 38 patients experienced diagnosis delay in a national referral hospital, while 40 patients were delayed in a non-national referral hospital. The reasons for the

Table 4. The association between provider delay and patient delay

	Patient delay n (%) (N = 132)	No patient delay n (%) (N = 162)	Total, n (%) (N = 294)	*p**	RR (95% CI)
Physician delay	16 (12.1)	2 (1.2)	18 (6.1)	**<0.001**	2.12 (1.71–2.62)
System-diagnosis delay	50 (37.9)	28 (17.3)	78 (26.5)	**<0.001**	1.69 (1.33–2.14)
System-treatment delay	119 (90.2)	53 (32.7)	172 (58.5)	**<0.001**	6.49 (3.85–10.96)

CI=confidence interval; RR=relative risk
*Chi-squared test

delay were; a prolonged imaging waiting time (47%), delayed anatomical pathology examination (31%), prolonged biopsy waiting time (24%), and repeated examinations due to inconclusive result (7%). Among 172 patients with system-treatment delay, 106 and 66 patients experienced delay in a national referral hospital and non-national referral hospital, respectively.

Provider delay played a significant role in the cancer treatment delay ($p<0.0001$) (Table 4). This study found that 44.9% of patients experienced patient delay (N = 132), with system-treatment delay as the most prevalent cause (90.2%), followed by system-delay (37.9%) and physician delay (12.1%).

DISCUSSION

This study evaluated treatment delay experienced by 294 cancer patients who consulted at the Department of Radiation Oncology in a national referral hospital of Indonesia. There were two types of delay highlighted in this study: patient delay and provider delay. The subjects' profile revealed that most patients were women with median age of 47 years (range, 36–50 years old). The provider delay was experienced by most of the subjects compared with patient delay.

A retrospective study in oral cancer revealed that the majority of patients (63.5%) made their first visit to medical personnel within 3–4 months from the onset of symptoms or first complaint. Additionally, patient delay was the major cause of treatment delay in head and neck cancers with an average delay of 3.5–5.4 months.[13] This result may be obtained because the study was conducted in a developed country (Germany). However, this study included cancers from three organs (cervix uteri, breast, and nasopharynx) in all stages that covered a wide range of samples. Our findings inferred that Indonesia needs a better health system on patient referral and cancer awareness. A systematic review of 87 studies (101,954 breast cancer patients) conducted by Richards et al[14] showed that patients who experienced treatment delay within 3 months or more had a 5-year survival rate 12% lower than patients who experienced treatment delay with shorter time interval (odds ratio = 1.47; 95% CI = 1.42–1.53).

The socioeconomic status and educational level have been known as the main factors causing treatment delay in cancer patients, including in countries with a well-established medical care system.[15-25] With regard to patient delay, this study found that patients aged >65 years old, with a lower level of education and history of alternative treatment tended to experience treatment delay ($p<0.05$).

In contrast, a study of a 3-month time interval in 152 breast cancer patients by Djatmiko et al[26] found no significant relationship between age and education and patient delay. Tumor size was obtained as the only factor associated with patient delay ($p<0.01$). In this study, only the oldest age group (>65 years old) showed a statistically significant relationship with treatment delay. Aging can affect patient delay through the disease awareness, education, or socioeconomic reason. Moreover, the results are varied due to differences in the medical care system (more established in developed countries), type of tumor, and sociocultural backgrounds between patients in each study. In addition, treatment delay in the oldest age group may be caused by difficulties in giving timely responses of their overall condition due to a reduced movement speed, a lack of caregiver, or reduced cognitive function. Further studies are suggested to investigate the relationship between socioeconomic background and education at different places in multicultural countries such as Indonesia and other factors such as caregiver availability or neuropsychiatric factors.

Furthermore, patients who experienced a treatment delay also had more advanced-stage cancer. Locally-advanced and advanced stages had a higher chance of experiencing treatment delay ($p<0.05$) in 46 and 31 breast and nasopharyngeal cancer patients, respectively. Smith et al[21] showed a similar result that stage III and IV breast cancer patients had a longer treatment delay time.

Similar to the finding in this study, Yurdakul et al[27] found that the major cause of a patient delay in 1,016 patients with lung cancer in Turkey was a lack of knowledge (69.4%). This was supported by Majeed et al[28] that patient delay was mainly associated with a lack of knowledge and economic factors as well as difficulties in reaching healthcare facilities.

In Indonesia, alternative or traditional treatment has been used continuously for generations. Data from the Basic Health Research (RISKESDAS) in 2018 showed that 31.4% of households in Indonesia preferred visiting traditional healers, and 24.6% used herbal medicine. This percentage was slightly higher compared to that in 2013, with 30.4% of households preferred traditional healers over conventional medicine.[29] This study showed that alternative treatment were mainly chosen due to the patients' anxiety to consult or undergo a medical procedure (76.1%) and the belief in alternative treatment to cure cancer (71.6%). Additionally, Mohd Mujar et al[30] and Akhtar et al[31] showed that the use of alternative treatment delayed health-seeking behaviors among patients with breast cancer in Malaysia and Bangladesh.

Of 294 patients, 214 patients experienced provider delay. The delay in treatment was also found in patients with more advanced-stage cancer. In 108 cervical cancer patients observed in this study, early-stage cancer resulted in a lower incidence of treatment delay ($p<0.05$). A median time interval of 120 days (range, 100–125 days) from the first time a patient sought medical consultation to underwent cancer treatment was obtained from the duration of the delay. This result aligned with the study by Yurdakul et al[27] that getting other opinions in the diagnosis by general practitioners (GPs) or primary health services was the major factor causing referral delay. This study found that delay in referral for breast cancer was rarely occurred. This might be due to the presence of breast lump as the most common symptom of breast cancer, which reduced the referral duration among the patients.[32]

We found that all physician delays occurred in primary health care. Among 62 patients referred from a primary health care, 18 patients (29.0%) experienced referral delay. Several studies have reported strategies to reduce the duration of referral. One of them is a protocol established by the Ministry of Health of the United Kingdom that determines the duration of referrals should not exceed 2 weeks. The National Institute for Health and Clinical Excellence has introduced referral guidelines for primary care physicians regarding symptoms that would indicate a possible cancer condition.[33] In addition, the physician and system delays found by Majeed et al[28] were mainly because of delay in scheduling diagnostic tests as well as waiting time for definitive treatment.

Toftegaard et al34 and Fønhus et al35 showed that a continuous medical education and patient-mediated information might lead to a higher number of cancer cases referral, reduction of cancer patients' referral time, improvement of professional practice, and increase of physicians' adherence to a recommended clinical practice. Smith et al[21] showed that the period from the first consultation to receiving definitive treatment was related to the survival rate of breast cancer patients. Treatment delay longer than 6 weeks decreased the survival rate of breast cancer patients. When the definitive treatment was carried out <6 weeks, the survival rate of breast cancer patients was 90%, whereas when the treatment was carried out >6 weeks, it decreased to 80%.[21]

A limitation of this study was that we did not conduct multivariate analyses, which could probably tackle important confounding factors such as cancer staging or age. Future studies may further explore the inclusion of these confounders into a regression model. Moreover, due to time constraints, we managed to recruit only 294 eligible samples during the time period. However, this study could represent cancer patients from all over Indonesia because the subjects were taken from a national referral hospital for cancer.

In conclusion, this study showed high rates of treatment delay in cancer patients either due to patient or provider delays. This study sought insight into cancer treatment delay in Indonesia, as reflected by the data of a national referral hospital of Indonesia. Other sociocultural factors such as age (oldest group of >65 years old) and level of education (primary school education level) may also influence patients' health seeking behavior. In reducing physician delay,

providing medical education about cancer to the GPs is recommended. Adding diagnostic and cancer treatment devices in hospitals with a long diagnostic queue list may also help to reduce the waiting time.

Further research is suggested to get a broader picture of the profile of delayed treatment in cancer patients, particularly in other centers. In addition, an interplay between risk factors and inclusion of several key confounders such as age or clinicopathological factors in assessing multivariate factors related to treatment delays and a further investigation of factors influencing older age (above 65 years old) are needed.

Conflict of Interest

The authors affirm no conflict of interest in this study.

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