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ORIGINAL ARTICLE

MINDFULNESS, SPIRITUALITY, AND QUALITY OF LIFE AMONG CANCER SURVIVORS UNDERGOING CHEMOTHERAPY: THREE-MONTH OBSERVATIONAL STUDIES

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ABSTRACT

Cancer survivors' population has continued to increase. However, survivorship remains challenging for most. Further development of new strategies to combat stress during survivorship was in demand. While religious-spiritual aspects were available as potential resources. A prospective study contributed 274 cancer survivors was conducted. Instruments included the Freiberg Mindfulness Inventory, Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being, Perceived Stress Scale, and the Brief World Health Organization Quality of Life. Three-time points data were set, baseline, one month, and three months. Data were analyzed using repeated-measures ANOVA. The results showed that the mean age of the 274 cancer survivors was 48.97 (11.85) years old with a survivorship period of 1.35 years. Series data obtained from three points measurements each variable were mindfulness 34.15, 33.12, and 40.41; spirituality 33.40, 30.87, and 32.56, stress 20.31, 21.56, and 19.48, and quality-of-life 61.49, 55.71, 63.84, respectively. In conclusion, cancer survivors experienced fluctuating levels of mindfulness and spirituality, stress, and quality of life for three months of observations. However, the natural improvement of mindfulness, spirituality, stress, and quality of life improved in month three.

Keywords: *Chemotherapy; coping; mindfulness; stress; quality of life*

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INTRODUCTION

The cancer survivor population has been growing. According to the National Cancer Institute, the number of cancer survivors kept increasing around the world (National Cancer Institute, 2022). The new cancer cases in the world are greater than 19 million, and Indonesia owns 396,000 cases; among them, more than 162,000 new patients survived (National Cancer Institute, 2022). The expanding number of cancer survivors needs special attention since they must overcome multiple difficulties caused by cancer treatments (Fitch, Lockwood, et al., 2021).

Commonly, cancer survivors receive various or combined treatments such as surgery, radiotherapy, and chemotherapy. Side effects related to those therapies such as pain, fatigue, and change of physical appearance can affect the survivors' abilities to perform routine daily activities (Manik, 2018). These persistent functional deficits, further, cause the survivors to suffer from depressive symptoms and other personal relationship strains and interfered with their work productivity (Duijts et al., 2014). Consequently, the survivors must struggle to cope with these stressors instead of enjoying their successful cancer survival.

Cancer survivors require an ultimate coping strategy to cope with life's challenges and the uncertainty surrounding cancer relapse. Pargament (2013) states that the patient's religious-spiritual aspects could be a long-lasting and beneficial coping strategy. For most, being diagnosed with cancer can improve the survivors' awareness of people and the world and expand their relationship with God (Cipriano-Steffens et al., 2020). This expanded awareness includes spiritual growth which can help cancer survivors to cope with their life stressors. The growth of spirituality, therefore, could improve life qualities of survival. Canada et al. (2016) argued that faith could directly

or indirectly affect patients' quality of life through the mediating role of meaning and peace. Improvements in faith, meaning, and peace are the consequences of expanding spirituality (Canada et al., 2013).

Intensive religious activities or rituals during suffering from cancer may facilitate the growth of spirituality among survivors, the growth, however, can be different based on their ethnic backgrounds. Indonesian are well-known as a religious countries (Gebauer et al., 2014). Therefore, people were habituated to religious and spiritual thoughts from the earlier of their life. During being exposed to such stressful events, being sick for example, they tried to take benefit from their religious background, then intensify them through spiritual self-transcendence (Reed, 2014). Enhanced spirituality, however, can contribute to the well-being of survivors.

Notedly, cancer survivors face multiple and long-term challenges in maintaining their quality of life, particularly if they received chemotherapy and might suffer both its effects and side effects that can cause the survivors great physical and psychological distresses (Noviyani et al., 2015; Vehmanen et al., 2014). Previous study findings have found that promoting patients' mindfulness has provided benefits for quality of life (Fish et al., 2014; Garner, 2014; Lötzke et al., 2016). Mindfulness is a mental condition when people are fully aware of the situation regarding physical and psychological ailments (Stratton, 2015). The state of mindfulness can facilitate peaceful feelings and is beneficial in managing emotional turbulence during stressful events (Gu et al., 2015; Tint & Zinkin, 2014). However, it is not clear whether mindfulness is helpful to maintain mindfulness, spirituality, perceived stress, and the perception of quality of life during the chemotherapy period. All instruments were using self-response questionnaires that risk fluctuating due to the period of chemotherapy, and most previous studies only portrayed them in one shoot measurement. This study aimed to describe the dynamic of mindfulness, spirituality, and quality of life among cancer patients undergoing chemotherapy, during the first three months of chemotherapy.

METHOD

Study design

A prospective, observational, and correlational research design was used. Data were collected with a set of structured questionnaires at three-time points, baseline, one month, and three months after discharge from the hospital.

Sample and Settings

Cancer survivors who were undergoing chemotherapy at Hospital Kariadi, Semarang, Indonesia from January to May 2018 and met the inclusion criteria were invited to the interview. A convenience sampling method was applied to recruit the cancer survivors who were newly registered for chemotherapy during January and February 2018. Inclusion criteria were all cancer survivors who visited the hospital during the period, understood Bahasa Indonesia well, and were fully independent. Patients who were under 16 years old or had memory disorders were excluded. The sample size was calculated using G-Power 3.1.9.7 with a medium effect size of 0.15, an alpha of 0.05, a power of 0.95, and 12 predictors for the repeated-measures ANOVA. At the baseline, a total of 280 survivors joined the study. One respondent dropped out at the first follow-up, due to not coming to hospital and could not be contacted and five respondents did not complete the questionnaire at the second follow-up. They did not provide any reason, and one passed away. Finally, 274 survivors fully participated in the study.

Instruments

Demographic Questionnaire

Demographic data were obtained using a demographic questionnaire and then validated in the medical record. This questionnaire investigated gender, marital status, educational background, job, religion, age, survivorship period, and monthly family income.

Mindfulness.

Mindfulness was measured by the Freiberg Mindfulness Inventory (FMI). The FMI consists of 14 items, and each item is scored by the participants with a four-point Likert scale ranging from 1 (rarely) to 4 (almost always). The total score ranges from 14 to 56 with a higher score indicating higher mindfulness. Its validity and reliability have been established (Sauer et al., 2013). The FMI was translated into the Bahasa Indonesia version for this current study. The translation procedure follows the steps of Sperber in translation and back translation (Mulyono & Ekowati, 2023). Cronbach's α for the internal consistency reliability was 0.86 with the corrected inter-item correlation of 0.32-0.86.

Spirituality

Spirituality was examined using the functional assessment of chronic illness therapy—spiritual well-being scale (FACIT-Sp). The validity and reliability of the Bahasa Indonesia version have been established (Widyaningsih et al., 2014). FACIT-Sp consists of 12 items involving three factors, faith, meaning, and peace. Each item is scored with a five-point Likert scale from 0 (not at all) to 4 (very much) with a total score of 0 to 48. A higher score indicates a greater spirituality. The Indonesian version FACIT-Sp reported a Cronbach α of 0.84 (Widyaningsih et al., 2014). In this study (n=274), Cronbach alpha for the internal consistency reliability was 0.7.

Stress

Stress of the participants was collected utilizing the Perceived Stress Scale (PSS) Bahasa Indonesia version (Syarif et al., 2019). PSS is a 10-item Likert scale questionnaire, ranging from 0 (never) to 4 (very often). The total score is from 0 to 40, and higher scores indicate higher stress perceived by the survivors. Its Cronbach's α was 0.81 (Syarif et al., 2019). In this study, Cronbach's alpha was 0.7.

Quality of Life

Quality of Life was measured using the WHOQOL-Bref Bahasa Indonesia version. This self-report questionnaire consists of 26 items rated on a 5-point scale (1 to 5). A higher score indicates a greater level of self-perceived quality of life. Each statement represents one facet of life that accounts for a person's quality of life. In a study with chronic renal failure patients (n=91), Cronbach's α was 0.90 for the total scale of the WHOQOL-Bref, and 0.76, 0.75, 0.46, and 0.81 for the physical health, psychological health, social relationships, and environmental domains, respectively (Ibrahim, 2004). In this study (n=274), Cronbach's α was 0.85 for the full questionnaire, 0.69 for physical domain, 0.74 for psychological domain, 0.68 for social relationship domain, and 0.83 for environmental domain.

Data Collection

Data collection was conducted three times. The procedures for data collection are described as follows. At first, the primary investigator of this study trained three research assistants on the use of the questionnaires and the steps of

the interview. Next, the research assistants practiced interviews with the patients who were recruited from the chemotherapy unit as volunteers. Until they felt confident, they started the data collection. Authors conducted sharing experience among assistants after assessment trial to confirm that they had similar abilities.

A list of survivors was acquired from the chemotherapy unit. The investigators explained the research procedure to the potential respondents and obtained the informed consent. The data collection was conducted during the participants' chemotherapy time for 20 minutes. The second and third data collections were done in the first month and three months after the baseline data collection during the participants' following routine chemotherapy visits.

Data Analysis

Data were analyzed using the IBM SPSS Statistics 21 (NY, Armonk). Descriptive data including frequency, percentage, mean, and standard deviation were presented based on the type of data. Normal distribution of the four main variables was checked to decide the accurate inferential statistical method. Since the dependent variables all showed a significant violation of Mauchly's test of sphericity and quadratic pattern, repeated-measures ANOVAs using the Greenhouse-Geisser tests and tests of within-subjects contrasts were employed (Nesselroade Jr & Grimm, 2018) to analyze the score changes over time of variables in baseline, after one month, and after three months.

Ethical Consideration

This study is a part of the first author's dissertation project. The project study received approval from the Ethical Review Committee in the Faculty of Medicine Diponegoro University (Hospital Kariadi) numbered 629/EC/FK-RSDK/X/2017 on October 23rd, 2017.

RESULTS

A total of 280 participants enrolled in this study and among them, 274 completed all data collection because one participant dropped out at the second data collection, and five were at the third data collection due to their declined condition or death. The demographic characteristics of the cancer survivors were presented in Table 1. Most participants were females (n = 171, 62.41%), married (n = 254, 92.7%), having a senior high school background (n = 83, 30%), working at the private sector (n = 90, 32.85%), and affiliated with Islam religion (n = 262, 95.62%). The average age was 48.97 (SD =11.8) years old, and the average year for being diagnosed with cancer was1.35 years ranged from 1 month to 5 years. Only 122 participants provided the income information. From the limited information, the monthly family income was IDR 2.5 million (equal to ±159.4 USD).

Table 1. Demographic Characteristics of the Participants (N=274)

Variables	*M*	SD	*n*	%
Gender				
Male			103	37.59
Female			171	62.41
Marital Status				
Unmarried			8	2.92
Married			254	92.70
Widow/widower			9	3.28
Undeclared			3	1.09
Education background				
Elementary school			79	28.83
Junior High school			55	20.07
Senior High school			83	30.29
Academy/Diploma			8	2.92
Undergraduate/Bachelor Degree			45	16.42
Master/Doctor			4	1.46
Job				
Government/police/military service			42	15.33
Private employee			90	32.85
Business/self-employee			33	12.04
Housewife			76	27.74
Dependant			33	12.04
Religion				
Islam			262	95.62
Catholic			8	2.92
Protestant			4	1.46
Age (years)	48.97	11.85		
Survivorship Period (in years)	1.35	2.31		
Monthly income (million IDR) (n = 122)	2.55	2.01		

As seen in Table 2, there was 26.64% of the total respondents for each colorectal and breast cancer diagnosis. Other types of cancers (such as tongue, femur, and rhabdomyosarcoma) accounted for 18.25%.

Table 2. Cancer Types of the Respondents (N=274)

Cancer Types	n	%
Colorectal	73	26.64
Breast	73	26.64
Ovarium	19	6.93
Nasopharynx	33	12.04
Lung	4	1.46
Prostate	5	1.82
Lymphoma malignant non-Hodgkin	12	4.38
Cervix	5	1.82
other	50	18.25

Scores Changes of Mindfulness, Spirituality, Perceived Stress, and Quality of Life Over Time

Figure 1 depicted score changes from three measurements. The graph indicated that spirituality, mindfulness, perceived stress, and quality of life across over time of three points measurement were change dynamically. Analysis using repeated-measures ANOVA test (all $p < .05$). Post hock test using Benferoni test, supported the difference scores over time (table 3).

Figure 1. Score Trend o of Spirituality, Mindfulness, Perceived Stress, and Quality of life

Changes of qualitative domains were displayed in figure 2. All domains except physical domains and environmental domains tend to increase over time.

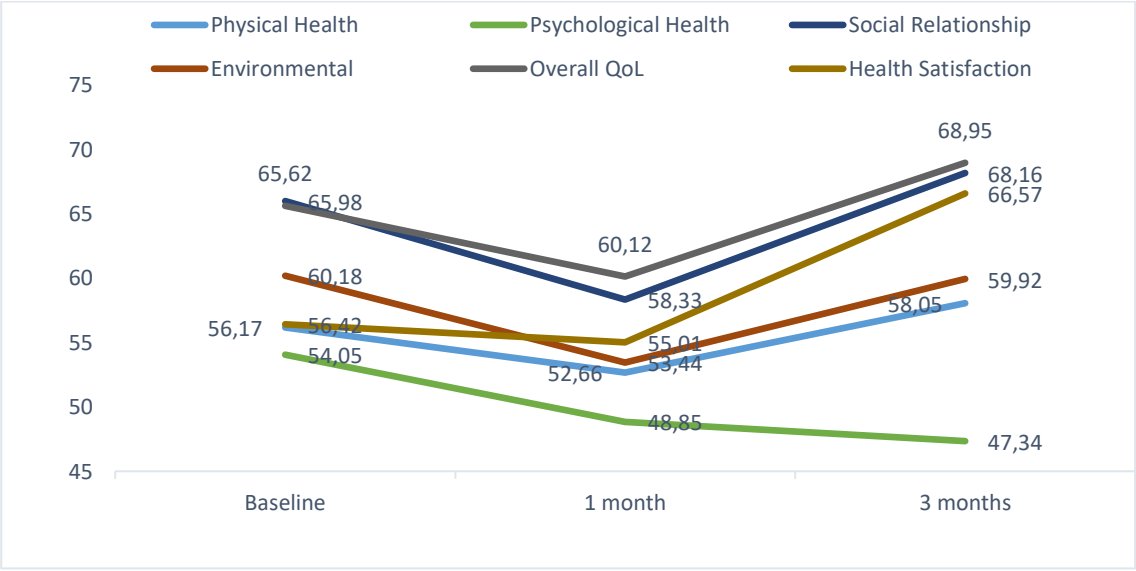

Figure 2. Trend Domains of Quality of Life

Table 3. Mean Difference Each Time Measurement

Variables	Time Measurement		Mean Diff	p
Spirituality	1	2	2.533*	0.00
		3	.847*	0.04
	2	1	-2.533*	0.00
		3	-1.686*	0.00
	3	1	-.847*	0.05
		2	1.686*	0.00
Mindfulness	1	2	-1.248*	0.00
		3	.828*	0.02
	2	1	1.248*	0.00
		3	2.077*	0.00
	3	1	-.828*	0.02
		2	-2.077*	0.00
Stress	1	2	1.029	0.04
		3	-6.259*	0.00
	2	1	-1.029	0.04
		3	-7.288*	0.00
	3	1	6.259*	0.00
		2	7.288*	0.00
QoL	1	2	5.774*	0.00
		3	-2.353	0.04
	2	1	-5.774*	0.00
		3	-8.128*	0.00
	3	1	2.353	0.04
		2	8.128*	0.00
Physical	1	2	4.386*	0.00
		3	-8.778*	0.00

DISCUSSION

This study featured mindfulness, spirituality, stress, and quality of life among cancer survivors during a three-month chemotherapy period. The trend of changes in the mean scores of those variables was fluctuating not linear. The changes over the three months, however, were all significant. Cancer survivors in this study were adults and productive people, 48.97 years old on average, and worked in the private sector (Table 1). Generally, adults at such age are the primary breadwinners of their families. According to a recent study, each adult person covered a hundred dependents (Hakim, 2020). It makes sense that most of the respondents felt stressed because they must share 2.2 million IDR (150 USD) monthly income with their families. Such money, however, maybe merely a small portion of monthly family expenses.

The perceived stress slightly increased at one month 21.56, after the baseline 20.31, measure and then decreased below the baseline in the three months 19.48 (figure 1). Out of control situation following being diagnosed with cancer was the main cause of stress. Average score for this item was 1.2, it meant that most of respondent perceive that they were worse. As studies reported that at the early week there were numerous physical dysfunction symptoms due to procedure for cancer such as radiotherapy and chemotherapy (Heijkoop et al., 2017; Miller et al., 2021). The trend of scores, however, suggested that the stress levels in the survivors were maintained consistently across the three months. Researchers have proposed that survivorship remains challenging for cancer survivors due to the process of stress adaptation. Cancer survivors experience physical, mental, social-economic, and personal relationship problems, and these problems can bring enormous consequences that challenge survivors' lives and create stressful events (Duijts et al., 2014; Koch et al., 2014; Pisu et al., 2015). In this study, about two third of respondents were less stressed than six months after cancer diagnosed. Therefore, there was increased perceived stress in the first month, a moment when they became more trusting of the interviewer than at the previous meeting.

As expected, this study found a high and fluctuating spirituality score of 33.33, 30.89, and 32.54 in the study sample (figure 1). These scores were in line with previous studies with more advanced cancer (Widyaningsih et al., 2014), and Japanese (32.0) but lower than Malaysian (35.91) (Raja Lexshimi et al., 2014), and American cancer survivors (37.0) (Canada et al., 2016). It has been argued that high spirituality is common for Indonesian population which is commonly religious (Nuraini et al., 2018; Rochmawati et al., 2018). At first, religious practice might consider just a routine obligation for Indonesian religious cancer survivors. However, being diagnosed with cancer has created not only a shocking moment but also a life-threatening event too. Consequently, their spiritualities were recultivated and grew, to help them adapt to the turmoil situation and to relieve distress. Therefore, exploring the cancer survivor's spirituality through such religious spiritual practices could be beneficial for their long survivorship life.

Like spirituality, mindfulness scores at the second measurement were lower than the first, and then sharply increased after three months, 34.15, 33.12, and 40.41. These mindfulness scores change naturally even though they did not receive such mindfulness training. A systematic review reported that standardized mindfulness-based therapies were used to alleviate physical and mental symptoms among cancer patients (Gotink et al., 2015). The mindfulness-based therapy was reported effective for women with breast cancer (Rahmani & Talepasand, 2015). The mindfulness score increased significantly after the mindfulness therapy and keep high after three months of follow-up (Dobos et al., 2015), however, the result of training was not equivocal (Carlson,

2016). As comparison, in this study, the mindfulness score also increased significantly after three months, baseline 34.06, one month 33.21, and after three months 40.37 (figure 1), even though the cancer survivors were not exposed to mindfulness-based therapy or training. Possibly, there were cultural or ethnic influences (Yedjou et al., 2019). For example, religiousness of population where the origin of mindfulness-based therapy is rooted from Indonesians were religious population where the religious aspect was implemented in their daily life. For example, a study said that Javanese Muslims were very spiritual ethics in Indonesia. Their culture and values were close to their relationship with God (Said & Ulyani, 2020), Therefore, everyone in Indonesia, such as cancer survivors in this study, has skill of mindfulness by nature.

Overall, spirituality and mindfulness might be well improved for Indonesians due to the religiousness typical population as Gebauer (2014) said in this study. Most of respondents in our study was Islam and Javanese which were very spiritual (Said & Ulyani, 2020). Islam devotees practice their religious routine five times a day. Following the stressful event, being diagnosed with cancer, cancer survivors intensified the religious routine. Because of positive religious coping, the spiritual improved into deeper personal experiences (Distinarista et al., 2018), a self-transcendence. Cancer survivors got benefit from spiritual/religious coping they practiced (Trevino et al., 2015) because, according to Reed, being diagnosed with cancer was a vulnerable event, and those improved wellness through a moment call self-transcendence (Leelakulthanit, 2022; Reed, 2014). Majority of respondents in this study might respond their stress of cancer diagnosed by their improvement of religious spirituality factors as they integrated religious spirituality in his/her coping strategy (Pargament, 2013; Pargament et al., 1988).

Quality of life change pattern was like mindfulness and spirituality trend except for the psychological domain. Three domains, physiological, social-relationship, and environmental decreased at the baseline then improved after three months (see graphic1). They indicated improved conditions following cancer therapy. This study confirmed Heijkoop et al. (2017) that physical and health problems increase at the five weeks and then became plateau after three months, except cognitive functioning. Another study also reported emotional and physical functioning progress among colorectal cancer survivors three months after chemotherapy (Miller et al., 2021). This study supported the finding how quality of life was decreased at the first month but increased after three months. About two third of respondents in this study were less than six months diagnosed with cancer. Several of them underwent radiotherapy serial before taking chemotherapy. Therefore, there were slightly higher quality of life at the baseline (Leung et al., 2022; Takahashi et al., 2008).

While the psychological domain of quality of life tended to be lower compared to the other domains. Low educational background might contribute to low health literacy which was an influential factor for quality of life as a study reported that subjective low health literacy was a predictor for worsened quality of life and mental disorders (Husson et al., 2015). Patients with elementary school (28.83 %) and junior high school (20.07%) educational backgrounds dominated this study sample. These levels of education commonly work in the low-level sector. Moreover, most of the respondents also worked as private employees (32.85%) where the presence at work was counted tightly. Work tight schedules, uncertainty, and low income were predictors of a person's happiness (Yamane et al., 2019). According to a study, cancer survivors who returned to work experienced low quality of life and depressive symptoms (Schmidt et al., 2019). Even though the physical functioning progressed, it did not return to the optimal functioning as before the cancer. Moreover, their cognition has not recovered from suffering from cancer. Therefore, the psychological domain remained unstable during the three months of chemotherapy.

In contrast to psychological domain, physiological dysfunction seemed not too burdening for cancer survivors after three months in this study, 55.38, 51.00, 64.16. This finding was not supported by previous arguments that physical disabilities were predisposition for numerous psychological problems because physical impairments prevent cancer survivors to access provided medical services (Edwards et al., 2020). Cancer survivors seemed to achieve support from family and social support for accessing services as reported in a study (Aprilianto et al., 2021). As commonly known that nowadays there were non-profit organizations or religious institutions have provided free ambulances for people need transportation. The budget for this service came from charities such as *amal* or *zakat* (Sari, 2018). Moreover, Indonesian such as Javanese neighbourhoods, or religious societies, such as "jamaah pengajian" or religious (Islam) communities were commonly very supportive for their member. Beside supporting financial, they also support socially such as supporting family while sick people being hospitalized. This support also considered as benefit of religious community (Koenig et al., 2012) for cancer survivors. Therefore, physical dysfunction was not a barrier to access the facilities.

This study only portrayed natural dynamic of subjective perception of cancer patients during their routine chemotherapy procedures. No situations were controlled. Results from this observational study are not able to explain the cause and effect of the phenomena. Since many respondents were Javanese cultural background, this result might not be able to represent Indonesia's population in general.

CONCLUSION AND RECOMMENDATION

This study pictured the natural change patterns of mindfulness, spirituality, stress, and quality of life for three months of observation. The results might indicate that cancer survivors experience dynamic levels of mindfulness, spirituality, stress, and quality of life. The natural improvement of mindfulness, spirituality, and quality of life, however, can be observed at the third month after the baseline measure.

The following study may develop various spiritual care topics such as measurement tools and intervention strategies besides the concept of it.

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