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ORIGINAL ARTICLE

Spirituality and associated factors among cancer patients undergoing chemotherapy

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Abstract

Aim: Patients' spirituality, the relationship between spirituality and physical pain, and the association between spirituality and quality of life (QOL) among patients undergoing cancer chemotherapy were examined. Spirituality was defined as a sense of meaning in one's existence and life, peace of mind, and the strength and comfort drawn from faith.

Methods: A cross-sectional questionnaire survey was distributed to 176 adult cancer patients who received chemotherapy in May–September 2011 at an outpatient clinic in rural Japan. Spirituality was measured using the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp-12). Demographic data were collected for performance status, cancer stage, age, marital status, occupational status, persons in household, pain intensity, and other troubling symptoms. The relationship between the patients' spirituality subscale score and QOL was assessed in a structural equation model.

Results: Two FACIT-Sp-12 subscales, meaning/peace and faith, were moderately to strongly associated with age, appetite, and QOL scores. Although physical pain was significantly related to the QOL score ($P = .002$), it was not related to the FACIT-Sp-12 score ($P = .427$). These results indicated that the patients with higher spiritual scores and severe pain were enjoying life more than the patients with lower spiritual scores and severe pain. Moreover, two subscales of the FACIT-Sp-12 had a direct effect on QOL.

Conclusions: Spirituality was strongly associated with QOL. Younger patients (<50 years old) and stage I cancer patients need additional assistance to meet their spiritual needs. To maintain cancer patients' spiritual well-being, nursing interventions should facilitate patients' nutrition support and appropriately address their spirituality.

KEYWORDS
cancer, chemotherapy, patient-centered care, quality of life, spirituality

1 | INTRODUCTION

1.1 | Background

In 2007, the Japanese government implemented the Cancer Control Act (Act No. 98 of 2006). Large disparities in cancer treatment among health-care facilities in Japan were problematic at the time, and the new law was designed to standardize care with the aim of saving lives whenever possible (Ministry of Health, Labour and Welfare [MHLW], 2007a). The Japanese government then formulated the Basic

Plan to Promote Cancer Control Programs, which is reassessed every 5 years, to ensure the rigorous fulfillment of the Cancer Control Act. Initiated in 2007, the Phase One Basic Plan included "efforts that assume the perspective of all citizens including patients with cancer" with the goal of reducing cancer deaths and lessening the distress experienced by all patients with cancer and their family members (MHLW, 2007b). The plan also included a provision that offers palliative care to patients with cancer starting at the time of cancer diagnosis (MHLW, 2007b).

The mainstream definition of palliative care at that time seemed to be the care of individuals in the terminal stage of an illness. However, palliative care not only provides relief from pain but also supports patients by helping them find meaning in their existence and in life (World Health Organization [WHO], 2018). To realize "a society in which all citizens including patients with cancer can understand, confront and resist cancer," Japan's Phase Two Basic Plan (from 2012 to 2016) was devised to achieve the two goals of the Phase One Basic Plan with the added goal of shaping a society in which people with cancer can live with peace of mind and improved quality of life (QOL) (MHLW, 2012). The Phase Three Basic Plan, launched in 2017, focuses on bolstering evidence-based cancer prevention and screening, ensuring patient-centered cancer treatment, and constructing a society in which people with cancer can live with dignity and peace of mind so that "all citizens including patients with cancer can understand and overcome cancer" (MHLW, 2017). Notable measures carried over from the previous plan include palliative care from the time of diagnosis, cancer control tailored for individual stages of life, consultation support, and information sharing.

The law reduced the mortality rate for patients with cancer (less than 75 years old) from 92.4 in 2005 to 80.1 in 2013 as the age-adjusted death rate per 100,000 people, and palliative care became widely available in Japan (MHLW, 2017). However, health-care facilities still vary in terms of palliative care practices and the management of symptoms including pain, and 30–40% of patients report dissatisfaction concerning both physical and emotional distress and the need for palliative care (MHLW, 2017).

It has been suggested that pain experienced by patients with cancer is complicated and difficult to control (Finnerup et al., 2015; Portenoy, 2011). Cancer pain is perceived through the concept of total pain, and it is important to provide care that encompasses physical, mental, social and spiritual elements. According to Twycross, Wilcock, and Toller (2010), pain is a somatopsychic phenomenon that is inevitably modulated by a person's mood, morale, and perception of the meaning of pain. Moreover, the word "cancer" implies the inevitability of death. When patients begin thinking about death from cancer, they suffer and think about the meaning of their existence and life. Therefore, much attention has focused on spirituality and spiritual care, which reduces spiritual pain (Selman, Young, Vermandere, Stirling, & Leget, 2014).

However, spirituality has a broad meaning in several research fields around the world (Counted, Possamai, & Meade, 2018; Kamata et al., 2014; Monod et al., 2011). Some researchers suggest that any study of spiritualty must involve religion (Kamata et al., 2014). Although most Japanese people identify themselves as not affiliated with any religion, or as not Buddhist, many Japanese people visit several shrines or temples to pray for divine help and most families have a Buddhist altar in their houses (Tatsukawa, 1998). In addition, many Japanese patients have a good-luck charm or *Ohuda* which is a strip of paper containing words with religious significance, for example, getting well soon or having a successful surgical operation. Some Japanese patients go to a shrine for an exorcism to "remove an evil spirit" with the goal of improving their health. Thus, many people in Japan pray for divine help in a variety of situations and can be considered spiritually minded.

1.2 | Literature review

The number of studies of spirituality among patients with cancer has been increasing for two decades. Evaluations of the relationship between spirituality and health-related QOL in particular have gained interest. Higher levels of spirituality have been associated with better QOL (Bai & Lazenby, 2015; Goncalves, Lucchetti, Menezes, & Vallada, 2017), more spiritual patients have superior survival rates (Balboni et al., 2010; Messina et al., 2010), and patients with spiritual pain have tended to report more severe physical and emotional symptoms than patients with no spiritual pain (Brady, Peterman, Fitchett, Mo, & Cella, 1999; Delgado-Guay et al., 2011; Whitford & Olver, 2011). Spiritual well-being has been a negative predictor of fatigue among patients with cancer (Lewis, Salins, Rao, & Kadam, 2014) and has been associated with coping styles among newly diagnosed patients with cancer (Whitford & Olver, 2011). Religious and spiritual interventions, such as life review, peer counseling, professional counseling, property preparation, or spiritual sessions, have resulted in better QOL, reduced spiritual pain, and increased spiritual well-being (Chimluang et al., 2017; Jafari et al., 2013; Wang, Chow, & Chan, 2017).

Monod et al. (2011) analyzed 35 studies that used 63 instruments for spirituality, and they reported that these instruments had good reliability and validity. They noted that two specific tools were adequate for assessing patients' spirituality: the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale: FACIT-Sp (Brady

et al., 1999) and the Spiritual Index of Well-being (Daaleman & Frey, 2004).

The FACIT-Sp has been tested on large samples of cancer patients and has shown good internal reliability, good convergent validity with other similar measures, and suitability for use in various clinical settings (Brady et al., 1999; Peterman, Fitchett, Brady, Hernandez, & Cella, 2002). The FACIT-Sp can also be used to assess the spiritual well-being of any religious or nonreligious individual by using nonspecific references to beliefs and practices. In addition, the spiritual domain of the FACIT-Sp was originally divided into two subscales (meaning/peace and faith), but it has been argued that meaning/peace should be divided into separate factors. Several research groups proposed that spiritual well-being can be deconstructed into three factors: peace, meaning, and faith (Canada, Murphy, Fitchett, Peterman, & Schover, 2008; Lazenby, Khatib, Al-Khair, & Neamat, 2013; Whitford & Olver, 2011). However, in Japan, Noguchi et al. (2004) suggested two subscales of the spiritual domain of the FACIT-Sp. The expanded version, FACIT-Sp-Ex, consists of 23 items and is also available (FACIT.org, 2010). Selecting the appropriate instrument to measure spirituality is necessary in studies of cancer patients' spirituality and QOL.

A few studies of the association between the spiritual subscale of the FACIT-Sp-12 and the QOL of adult patients with cancer have revealed several different results among various religions, ethnicities, and countries. In Bai and Lazenby's systematic review of 36 studies (Bai & Lazenby, 2015), a positive association between overall spiritual well-being and QOL was observed in most studies; they noted that the FACIT-Sp-12 subscale faith was not consistently associated with QOL, whereas the FACIT-Sp-12 subscale meaning/peace was associated with QOL. Canada, Murphy, Fitchett, and Stein (2016) revealed that faith contributed to patients' QOL through meaning. In a study of a Muslim population, overall spiritual well-being was negatively correlated with emotional well-being despite its positive correlations with functional well-being and social/family well-being, and faith did not contribute to the prediction of QOL (Lazenby et al., 2013). Faith often refers to religion in some countries. Religion is a personal component that holds different meanings for different countries and ethnicities; thus, different results for the faith score of the FACIT-Sp-12 would be expected for different religious groups, nonreligious groups, ethnicities, and countries.

Spiritual care is part of palliative care. Overall palliative care can increase patients' QOL (Bakitas et al., 2009; Bischoff, Weinberg, & Rabow, 2013; Kassianos, Ioannou, Koutsantoni, & Charalambous, 2017; Yamagishi et al., 2012; Zimmermann et al., 2014). A groundbreaking study published in Temel et al. (2010) revealed that early palliative care leads to longer survival; survival was prolonged by 2.7 months among patients with lung cancer who received intervention by palliative care specialists starting from the time of diagnosis. Another study examined an intervention in which nurses provided support to primary caregivers such as family members over the phone; the 1-year survival rate among patients with cancer was 15% higher when this intervention was initiated at the time of diagnosis than when it was initiated 3 months after diagnosis (Bakitas et al., 2015). In other words, patients can extend their survival by maintaining relationships with family and friends. Another investigation of palliative care indicated that medical staff were better suited than religious groups to provide patients with end-of-life care (Balboni et al., 2013).

Researchers in Japan have also studied spirituality among patients with cancer. In a qualitative study, 821 patients and family members were asked about the spiritual care they wanted to receive (Komura et al., 2011). A life review intervention has been demonstrated to be effective for maintaining spiritual health (Ando, Morita, Akechi, & Okamoto, 2010). There have been many interpretations in studies of spiritual pain. Murata (2003) defined spiritual pain as "pain caused by extinction of the being and the meaning of the self." In this characterization, spiritual pain is suffering akin to a loss of self that is triggered by any number of events. Consequently, spiritual pain can be associated with distress originating from relationships, a loss of control, a sense of burden, the loss of roles, enjoyment and self-identity, important matters remaining incomplete, a lack of hope in battling an illness, a lack of hope in general, suicidal ideation from death anxiety, appeals for euthanasia or assisted suicide, desperation and loss of dignity.

The interfaith chaplain Taniyama (2016) stated that spiritual pain is pain and suffering such as regretting unsettled past issues, being incapable of reconciling with relatives and friends, finding it unbearable when one cannot eat or excrete by oneself, being unable to accept one's own deterioration, and feeling useless when one requires constant nursing. Consequently, spiritual pain can be defined as the mental distress felt by cancer patients that is caused by an extinction of the being and meaning of the self. Patients who face a crisis in their life, loss of their peace of mind, and/or loss of the meaning of life and who have no support from other people or organizations need spiritual care to help them live with hope (Kubodera & Inoue, 2009).

It is therefore important to enhance the quality of palliative care, including spiritual care. Since appropriate care for spiritual pain has been found to improve patients' spiritual well-being, their ability to cope with distress, and their QOL, it is useful to determine cancer patients' spiritual states and actively provide treatment to those who suffer from cancer.

2 | PURPOSE

The purpose of the present study was to examine the level of patients' spirituality, the relationship between spirituality and physical pain, and the association between spirituality and QOL among patients undergoing chemotherapy for cancer. We selected cancer patients undergoing chemotherapy as outpatients because they are one of the largest populations in the hospital. In this study, spirituality was defined as having a sense of meaning about one's existence and life, peace of mind, and the strength and comfort drawn from faith (Murata & Morita, 2006; Peterman et al., 2002).

3 | METHODS

3.1 | Participants

The study participants were selected from among all of the patients with cancer who were undergoing outpatient chemotherapy at a specialized cancer hospital in a rural area of Japan between May and September 2011. Individuals were included in the study if: (a) they had been notified of their cancer diagnosis; (b) they were aged >20 years; (c) 1 month or more had passed since their initial diagnosis; (d) they were physically capable of completing the questionnaire and consent form; (e) they were negative for severe mental impairment and dementia; and (f) they were diagnosed with advanced cancer or the treatment period could be confirmed. Patients were excluded if they were hospitalized for surgery to eliminate the effects of postsurgical pain. Patients who agreed to participate and signed the consent form completed and submitted the questionnaire in a sealed envelope. The questionnaire in the sealed envelope was sent back to the research office by post or put in an assigned box near the reception desk at the outpatient chemotherapy center.

3.2 | Measures

Data on the patients' characteristics, including gender, age, cancer type, cancer stage, and performance status (PS), were collected from demographic and medical charts. The PS is a measure of the limitations in an individual's activities of daily life (ADLs), with values ranging from 0 (able to carry out activities without any problems) to 4 (completely disabled). Additional questionnaire items were the presence/absence of cohabiting family members, marital status, and employment type.

Data regarding the patients' physical pain and other symptoms were collected using the screening sheet produced by the Outreach Palliative Care Trial of Integrated Regional Model Project (OPTIM Project, 2011). The patients answered questions related to the effects of their symptoms on their daily lives, plus any inquiries they may have. The screening sheet designated the following as "distressing symptoms": pain, drowsiness, shortness of breath, nausea, cough, stomatitis, constipation, bloating, poor appetite, fatigue, fever and insomnia. The questions about pain collected detailed information on the strongest and weakest pain felt in the last 24 hr, the location of the pain, and a 24-hr pain profile. The intensity of the strongest and weakest pain felt in the last 24 hr was rated with a visual analog scale (VAS) that ranged from 0 (no pain) to 100 (strongest pain imaginable). The other symptoms were rated yes/no. Regarding pain, we collected information about prescriptions for narcotics and other analgesics from the patients' medical charts.

Spirituality was measured with the FACIT-Sp version 4, developed by Cella et al. (1993) and Peterman et al. (2002). The FACIT-Sp has been shown to be a reliable and valid instrument (Brady et al., 1999; Victorson, Barocas, Song, & Cella, 2008) and is available in Japanese (Noguchi et al., 2004). The FACIT-Sp consists of two parts: a 12-item spiritual well-being part (the FACIT-Sp-12) and the Functional Assessment of Cancer Therapy-General (FACT-G), which is also used as a QOL questionnaire for patients with cancer. In this study, spirituality was measured with the FACIT-Sp-12, which has two subscales: an eight-item meaning/peace subscale and a four-item faith subscale. Responses are given on a five-point Likert scale, with higher scores indicating stronger spirituality.

The patients' QOL was measured with the FACT-G, which measures physical well-being (PWB) with seven items, social/family well-being (SWB) with seven items, emotional well-being (EWB) with six items, and functional well-being (FWB) with seven items. Responses are given on a five-point Likert scale, with higher scores indicating better QOL. The present study obtained permission to use the FACIT-Sp by completing a registration process on the official website (FACIT.org, 2010).

We used the meaning/peace and faith subscales, which together comprise the 12 items of the spiritual well-being scale, as the primary outcome measures in this study.

3.3 | Statistical analysis

The patients' characteristics, symptoms, and FACIT-Sp scores were analyzed with descriptive statistics. The spirituality scale scores and other items were analyzed with simple linear regression and the Mann–Whitney *U* test. These analyses were performed with JMP for Windows, ver. 13.0.0 (SAS Institute Inc., Cary, NC, USA). We then performed a structural equation model analysis to examine the association between the spirituality and QOL data using IBM® SPSS® Amos for Windows, ver. 25 (IBM, Armonk, NY, USA). The level of significance was set at $P < .05$.

3.4 | Ethical considerations

The process of collecting questionnaire data and other data from Hospital A was reviewed by the Ethics Committee of the School of Medicine and the ethics committee of the participating institution. University A approved this investigation (No. 1652). Personal data were coded, and all surveys were anonymously completed. The patients' data were kept in a secure location.

4 | RESULTS

4.1 | Participants

The FACIT-Sp questionnaire was administered between May and September 2011 at Hospital A to the 215 outpatients undergoing chemotherapy at an ambulatory treatment unit who consented to participate in the study. The return rate for the questionnaire was 86.0% (185 patients), and 176 of those 185 patients completed all of the questionnaire items. Spirituality was thus analyzed for a total of 176 participants. The participants' characteristics are summarized in Table 1. In terms of PS, a measure of the restriction of ADLs, no patients reported a rating of 4, which would have denoted complete physical disability.

The screening sheet asked the participants which symptoms were currently troubling them. Fatigue garnered the highest response rate (61.4%), followed by drowsiness (34.7%), poor appetite (20.5%) and bloating (20.5%). Regarding pain intensity, the percentage of pain VAS scores between 40 and 59 was 13.6%, and the percentage of scores over 60 was 15.9%.

4.2 | Descriptive data obtained from the FACIT-Sp-12 subscale and the FACT-G

We performed a factor analysis of the patients' FACIT-Sp-12 responses to confirm the numbers of factors that were items of spirituality. One factor did not show enough contributions from each item. Three factors did not separate the items of meaning, peace and faith that Canada and colleagues suggested (2008). Two factors showed good separation between meaning/peace and faith. We thus found that two factors of the FACIT-Sp-12 were appropriate for use in this study. The two factors of the spiritual well-being subscale were calculated as having reliability coefficients of 0.894 for meaning/peace, 0.863 for faith, and 0.928 for the total score of the FACIT-Sp-12, suggesting good internal consistency.

The reliability coefficients for the FACT-G were as follows: PWB, 0.792; SWB, 0.747; EWB, 0.764; FWB, 0.864; and FACT-G total, 0.877. All values were over 0.70 in this study. We calculated the mean, median, and standard deviation (SD) of the subscales of the FACIT-Sp-12 (meaning/peace and faith) and the FACT-G (PWB, EWB, social well-being, and FWB); these values are provided in Table 2.

TABLE 1 Participants' characteristics (n = 176)

Demographics	Patients (%)
Age	
Mean 60.2 years (range 22-88)	
Gender	
Male	44 (25.0)
Female	132 (75.0)
Cancer type	
Breast	68 (38.6)
Gynecological	44 (25.0)
Pancreatic/liver/bile duct	27 (15.3)
Colorectal	17 (9.7)
Gastric	6 (3.4)
Lung	5 (2.8)
Urological	1 (0.6)
Thyroid	1 (0.6)
Double cancer (lung and breast)	1 (0.6)
Other	6 (3.4)
Stage	
I	19 (10.8)
II	21 (11.9)
III	34 (19.3)
IV	99 (56.3)
Unknown	3 (1.7)
Performance status	
0	131 (74.4)
1	28 (15.9)
2	13 (7.5)
3	2 (1.1)
unknown	2 (1.1)
Marital status	
Married	139 (79.0)
Divorced/widowed/single	37 (21.0)
Employment type	
Full-time/part-time	55 (31.3)
Unemployed	121 (68.7)
Living arrangement	
Living with family	158 (89.8)
Living alone	18 (10.2)

4.3 | Factors related to the spiritual subscale

The data on characteristics and scores for meaning/peace and faith of the spiritual well-being subscale are shown in Table 3. With simple linear regression and the Mann–Whitney U test, the items that exhibited a significant

relationship with meaning/peace were age ($P = .0271$), poor appetite ($P = .0372$), insomnia ($P = .0485$), the four subscales of the FACT-G ($P < .0001$), and the FACT-G total ($P < .0001$). The items that exhibited a significant relationship with faith were age ($P = .0008$), poor appetite ($P = .0080$), cancer stages I and IV ($P = .0076$), the four subscales of the FACT-G ($P < .0001$), and the FACT-G total ($P < .0001$).

4.4 | Spirituality and physical pain

Physical pain scored by the VAS was significantly negatively related to the FACT-G (QOL) scores ($P = .002$) according to simple linear regression. However, the patients' physical pain scores were not related to their responses to the FACIT-Sp-12 ($P = .427$) or to either of the two FACIT-Sp-12 subscales ($P = .328$ for meaning/peace, $P = .687$ for faith).

We then selected the patients who reported enjoying life (from item #3 comprising the FWB subscale of the FACT-G) in order to compare the patients with higher spiritual scores and severe pain and those with lower spiritual scores and severe pain. "Enjoying life" was rated on a scale from "0, not at all" to "4, very much" on the FACT-G. We calculated high and low levels of meaning/peace and faith by using the quartile values for the spiritual scores in this study. The upper quartile value (75%) for meaning/peace was 26 out of a total score of 32, and scores over 26 were reported by 42 patients. The lower quartile value (25%) for meaning/peace was 18 out of 32, and scores under 18 were reported by 45 patients. We observed that the patients with severe pain and higher meaning/peace scores were enjoying life significantly more than the patients with severe pain and lower meaning/peace scores, as illustrated in Figure 1 ($P = .0016$). For faith, the upper quartile value (75%) was 12 out of 16 ($n = 40$ patients), and the lower quartile value (25%) was 8 out of 16 ($n = 56$ patients). Patients with higher faith scores and severe pain were enjoying life significantly more than patients with lower faith scores and severe pain ($P = .0101$, Figure 2).

4.5 | The association between two subscales of the FACIT-Sp-12 and QOL

Table 4 shows the Spearman's correlation coefficient for each subscale of the FACIT-Sp-12. Figure 3 illustrates the causal relationship between the two subscales of the FACIT-Sp-12 and the subscale of QOL (i.e., FACT-G). We examined several models using Akaike's information criterion, and the best model is shown in Figure 3. The model fitness was acceptable, as evidenced by the following values: the minimum discrepancy dived by degrees of freedom (CMIN/DF) = 1.897, the goodness-of-fit index (GFI) = 0.965, the adjusted goodness-of-fit index (AGFI) = 0.919, the confirmatory fit index (CFI) = 0.979, and the root mean square error of approximation (RMSEA) = 0.072.

The structural equation modeling analysis revealed that the two subscales of the FACIT-Sp-12 had both direct and indirect effects on the patients' QOL. The estimated effects of the meaning/peace on QOL were 0.207 for EWB, 0.444 for FWB, and 0.415 for SWB. The estimated effects of the faith subscale on QOL were 0.268 for EWB, and 0.294 for FWB. Through the intermediation of EWB, meaning/peace and faith affected the patients' PWB. Additionally, pain intensity negatively influenced the patients' PWB scores.

5 | DISCUSSION

We examined the level of spirituality and the factors associated with the meaning/peace and faith subscales of a

TABLE 2 FACIT-Sp descriptive statistics ($n = 176$)

Subscale	Total items	Mean	SD	Median	Possible range	Actual range
FACT-G						
Total	27	76.0	15.2	78.2	0-108	27.5-104.8
Physical well-being	7	19.7	5.5	21.0	0-28	0-28
Social/family well-being	7	19.9	5.3	19.9	0-28	0-28
Emotional well-being	6	16.1	4.8	17.0	0-24	0-24
Functional well-being	7	20.3	5.9	21.0	0-28	0-28
FACIT-Sp-12						
Total	12	31.0	10.4	32.0	0-48	0-48
Meaning/peace (item 1-8)	8	21.6	6.6	21.5	0-32	0-32
Faith (item 9-12)	4	9.4	4.3	9.5	0-16	0-16

Abbreviations: FACIT-Sp, Functional Assessment of Chronic Illness Therapy- Spiritual Well-Being; FACIT-Sp-12, 12-item Spiritual well-being in Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale; FACT-G, Functional Assessment of Cancer Therapy- General; SD, standard deviation.

TABLE 3 Relationship between FACIT-Sp-12 and characteristics ($n = 176$)

	Meaning/peace		Faith		FACIT-Sp-12 Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age						
20-39 years	*19.3	5.4	***6.3	3.1	**25.5	7.8
40-49 years	19.6	6.6	8.3	4.1	28.0	10.4
50-59 years	21.0	7.6	8.9	4.8	29.8	11.8
60-69 years	22.5	6.5	10.0	4.0	32.5	9.8
70-79 years	22.8	6.0	10.6	4.3	33.4	9.6
≧80 years	22.0	6.7	10.1	2.5	32.1	9.1
Gender						
Male	21.9	6.5	9.7	4.3	31.5	10.3
Female	21.5	6.7	9.3	4.3	30.8	10.4
Marital status						
Married	21.6	6.5	9.3	4.2	31.0	10.2
Divorced/widowed/single	21.4	7.4	9.6	4.5	31.0	11.1
Work status						
Full-time/part-time	22.4	6.4	9.8	4.2	32.3	10.0
Unemployed	21.2	6.7	9.2	4.3	30.4	10.5
Stage						
I	19.3	6.8	7.0	4.4	26.3	10.8
II	20.8	6.6	9.4	4.6	30.2	10.6
III	21.1	6.2	9.1	4.0	30.2	9.8
IV	22.3	6.8	9.9	4.2	32.1	10.4
			**Stage I < stage IV		*Stage I < stage IV	
PS						
0	21.4	6.5	8.9	4.2	30.3	10.0
1	21.9	7.2	10.6	4.6	32.5	11.5
2	23.5	7.3	10.5	4.2	33.9	11.2
3	15.0	1.4	9.5	2.1	24.5	0.7
4	-	-	-	-	-	-
Cancer type						
Breast	20.6	6.8	8.7	4.4	29.3	10.6
Gynecological	22.0	6.5	9.8	4.3	31.8	10.2
Pancreatic/liver/bile duct	22.1	6.6	7.2	4.3	32.2	10.3
Colorectal	21.7	6.2	10.0	4.1	31.1	9.8
Gastric	24.2	5.1	11.0	2.8	35.2	7.9
Lung	19.2	11.9	7.2	5.1	26.4	16.7
Troubling symptom						
Pain : 60-100 (VAS)	20.3	8.6	8.8	5.2	29.1	13.3
Fatigue	21.0	6.2	9.1	4.2	30.1	9.8
Poor appetite	*19.7	6.7	**7.6	3.9	*27.3	10.2
Insomnia	*19.1	6.9	9.6	4.8	28.7	11.1
Nausea	21.1	6.6	8.3	4.2	29.4	10.4

(Continues)

TABLE 3 (Continued)

	Meaning/peace		Faith		FACIT-Sp-12 Total	
	Mean	SD	Mean	SD	Mean	SD
Bloating	21.4	6.1	8.9	4.2	30.4	9.8
Drowsiness	20.8	6.3	9.0	4.1	29.7	9.8

Abbreviation: FACIT-Sp-12, 12-item Spiritual Well-Being in Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale; PS, performance status; SD, standard deviation; VAS, visual analog scale.
*$P < .05$
**$P < .01$; ***$P < .001$ (Mann–Whitney U test. Simple linear regression applied for age.)

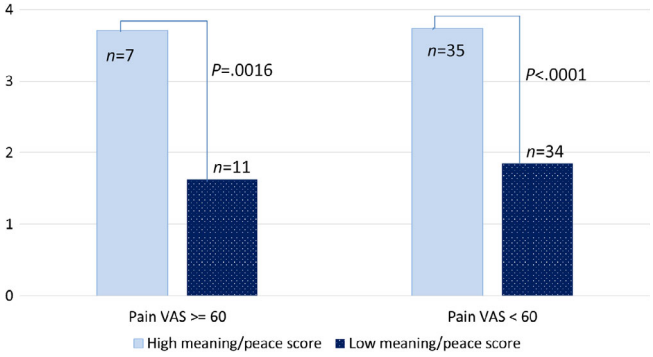

FIGURE 1 Effect of meaning/peace on life enjoyment despite physical pain

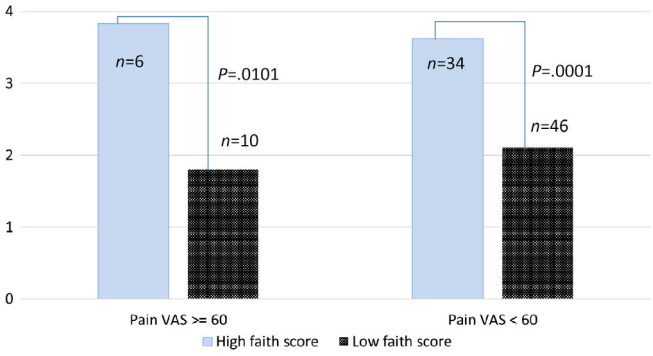

FIGURE 2 Effect of faith on life enjoyment despite physical pain

spirituality scale by assessing the questionnaire responses of patients with cancer. The patients' responses regarding their spirituality were strongly associated with their responses regarding their QOL. In addition, the questionnaire items that received high scores for both meaning/peace and faith were older age, appetite, and higher QOL scores (FACT-G).

In a large US study of 8,864 cancer survivors using the FACIT-Sp-12, women, older adults (60–79 years old), non-Hispanic Black patients, those with uterine cancer, and those who were married had higher FACIT-Sp-12 scores (Munoz, Salsman, Stein, & Cella, 2015). In studies of cancer patients undergoing chemotherapy, older adults and those with better PS had higher spiritual scores (Mesquita, Chaves, Nogueira,

TABLE 4 Spearman correlations between FACIT-Sp-12 and FACT-G

	Meaning/peace	Faith	FACIT-Sp-12 total
FACT-G total	0.7045***	0.6299***	0.7146***
PWB	0.3092***	0.3070***	0.3004***
SWB	0.4670***	0.4549***	0.4897***
EWB	0.5063***	0.4664***	0.5193***
FWB	0.6974***	0.6610***	0.7110***

Abbreviations: EWB, emotional well-being; FACIT-Sp-12, 12-item Spiritual Well-Being in Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale; FACT-G, Functional Assessment of Cancer Therapy-General; FWB, functional well-being; PWB, physical well-being; SWB, social and family well-being.
***$P < .001$.

Panzini, & Carvalho, 2013; Ooeki, 2013). In the present study, older adults (60–79 years old) showed higher scores for total spiritual well-being and the subscales of meaning/peace and faith; younger adults (20–39 years old) scored lower on spirituality. Our findings are thus similar to those obtained by Munoz et al. (2015), Mesquita et al. (2013), and Ooeki (2013). In the present study, the younger patients with stage I cancer scored lower on spirituality. Some younger patients less than 50 years old undergoing chemotherapy had received their initial cancer diagnosis within the year leading up to the study. According to Hui et al. (2016), patients who are diagnosed with cancer need professional palliative care within 1 year. In addition, the younger adult patients in our study reported experiencing sadness about the diagnosis; appearance problems such as changes in their nail color, skin trouble, edema, or alopecia due to cancer treatment; suicidal ideation caused by death anxiety; and changes in their role at work or at home. Such patients appeared to be confused or burdened about the meaning of their lives from the time of diagnoses. Consequently, palliative care including spiritual care should be provided not only at end-of-life stages but also at early stages, such as within 1 year after an initial cancer diagnosis,

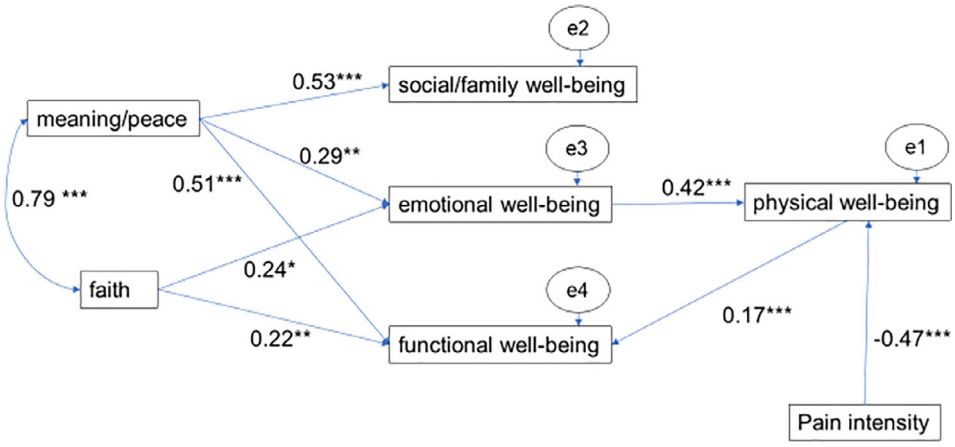

FIGURE 3 Model for direct effects and indirect effects of meaning/peace and faith on quality of life (QOL)

*P<.05, **P<.01, ***P<.001

especially among individuals younger than 50 years old and those in the workforce.

Poor appetite was associated with the spirituality levels of the participants in the present study. Several studies have revealed an important relationship between poor appetite and the physical limitations that patients feel (Amano et al., 2018). Patients with spiritual pain were also reported to suffer from anorexia, drowsiness, anxiety, and depression (Delgado-Guay et al., 2011). It is thus essential to evaluate cancer patients' appetite and nutritional support in order to promote the use of spirituality in coping with cancer.

Although our present patients' pain intensity was associated with their QOL, their reported pain intensity was not associated with their spiritual well-being. This result is the same as that reported by Brady et al. (1999) and by Maco, Galek, and Poppito (2006). Insufficient pain relief can affect a patient's QOL by impairing his or her ADL; spiritual pain has been described as pain deep in one's soul that is not physical (Maco et al., 2006). However, the alleviation of severe pain or symptoms has resulted in higher reported levels of spirituality (Bischoff et al., 2013). Spiritual pain can make patients' physical and emotional symptoms worse. Severe physical and emotional symptoms can be associated with spiritual pain, but the causality of this association is not known. Routine spiritual assessments to identify spiritual needs and total symptom management that includes this type of assessment can thus contribute to improving cancer patients' QOL.

Our use of structural equation modeling revealed that meaning/peace and faith as spiritual subscales were good predictors of QOL. Meaning/peace in particular directly contributed to the patients' FWB, SWB, and EWB. Since spiritual pain can be caused by relationships with others including family members, friends, or medical staff, meaning/peace which reflects having a sense of meaning in one's existence and peace of mind can be expected to have a strong effect on SWB. Moreover, the loss of control, as a type of spiritual pain, affects an individual's autonomy, resulting in poor FWB. Although we observed that the meaning/peace subscale contributed to the patients' SWB, faith did not. Faith is based more on self-identity than on relationships with others; meaning/peace is connected more to relationships with others than to oneself.

Both meaning/peace and faith both directly contributed to the patients' EWB in our study. Spiritual pain in cancer patients has been defined as mental distress (Kubodera & Inoue, 2009), and in a study measuring spiritual well-being with a depression and anxiety scale, spiritual well-being was negatively correlated with depression and anxiety (Ando et al., 2010; Noguchi et al., 2004). The direct effects of meaning/peace and faith on EWB revealed by our present analysis are thus understandable. Meaning/peace and faith also contributed indirectly to our patients' PWB via their EWB. Similar to somatopsychic phenomena, this indirect relationship is also understandable.

To determine whether “age” was a confounding variable on the association between two subscales of the FACIT-Sp-12 and QOL, a stratified analysis was performed. Then, a multiple regression analysis was performed with the QOL (the FACT-G) as the dependent variable. Age was not a confounding variable through the investigation.

5.1 | Study limitations

First, because of the large disparities in palliative care practices and the management of symptoms including pain among health-care facilities in Japan, we focused on one cancer-specialization hospital that could yield good-quality data rather than considering a large number of hospitals. Our results therefore cannot be generalized across Japan or beyond.

Second, the cross-sectional nature of this study did not allow us to definitively determine the level of spirituality in any situation, with spiritual levels differing among patients

and across circumstances, such as when the initial diagnosis occurs, when severe pain occurs, and when patients have comfortable and calm days. Therefore, further investigation is needed to examine changes in the spirituality levels of patients with cancer. A longitudinal study examining improvements in patients' spiritual well-being is needed in order to improve the patients' QOL.

Third, the difference between the two spirituality subscales we used was ambiguous among Japanese people who identified themselves as spiritual but not religious. Although a difference between meaning/peace and faith was revealed in the structural equation model in this study, a strong correlation between meaning/peace and faith was observed. Cultures, religions, and ethnicities strongly affect spirituality. Notably, faith has been reported to have a moderate to strong association with religion (Peterman et al., 2002). In this study, we defined spirituality as a sense of meaning in one's existence and life, peace of mind, and the strength and comfort drawn from faith; the patients were not asked about their religious beliefs or activities. Moreover, a survey in Japan by Noguchi and colleagues (2004) showed no significant difference in the spiritual scores on the FACIT-Sp-12 between patients who had religious beliefs and those who did not. In this context, spiritualty goes beyond specific religions despite its strong connection with religion. Evaluations of nursing care using the spirituality scale would contribute to improved nursing care. It is therefore important to examine the relationship between the two subscales and other validated measures, such as coping style, views of life and death, and social support among Japanese patients.

6 | CONCLUSION

Our analysis of the questionnaire responses of 176 adult cancer patients who were undergoing chemotherapy revealed that their level of spirituality was strongly associated with, and was a good predictor of, their QOL. Moreover, the parameters associated with high scores on both the meaning/peace subscale and the faith subscales were patients being older, having a good appetite, and having a higher QOL score. Thus, patients less than 50 years old, patients in the workforce and patients with stage I cancer need additional assistance to meet their spiritual needs. To maintain the spiritual well-being of cancer patients, nursing interventions should facilitate patients' nutrition support and appropriately continue spiritual assessments as well as spiritual care.

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CONFLICTS OF INTEREST

The authors disclose no conflict of interest.

DISCLOSURE STATEMENT

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AUTHOR CONTRIBUTIONS

YK designed the study, and undertook the data collection, data analysis, and prepared the manuscript. TM supervised the analysis and research process. Both authors read and approved the final manuscript.

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