

ORIGINAL RESEARCH

Spiritual Well-being and Quality of Life for Patients Undergoing Chemotherapy for Pancreatic Cancer: Correlates and Influencing Factors

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ABSTRACT

Context • Pancreatic cancer (PC) is one of the most malignant digestive cancers, characterized by a poor prognosis. PC patients receiving chemotherapy can endure immense physical and psychological pain, negatively impacting spiritual well-being and QoL.

Objective • The study intended to investigate PC patients' statuses regarding spiritual well-being and QoL, to identify and analyze the influencing factors, and to develop feasible spiritual-care plans, which could provide a reference for clinicians in promoting the spiritual well-being and QoL of PC chemotherapy patients.

Design • The research team performed a prospective survey.

Setting • The study took place at the Second Affiliated Hospital of the Army Medical University in Chongqing, China.

Participants • Participants were 120 patients who underwent chemotherapy for pancreatic cancer (PC) at the hospital between November 2020 and April 2022. The research team selected participants using convenience sampling.

Outcome Measures • The outcome measures included: (1) a self-designed questionnaire to identify participants' demographic and clinical characteristics and (2) the Functional Assessment of Chronic Illness Therapy-Spiritual Well-being Scales (FACIT-Sp). The research team

used the FACIT-Sp's two subscales, FACT-G and the FACIT-Sp-12, to evaluate participants' quality of life (QoL) and spiritual well-being, respectively.

Results • The total scores for participants' spiritual well-being and QoL were 26.2 ± 5.39 and 65.44 ± 17.1 , respectively. Spiritual well-being was positively correlated with the QoL ($P < .001$). According to the multiple linear regression analysis, the main factors influencing spiritual well-being were age ($P < .01$), education level ($P < .001$), average monthly income per capita of the family ($P < .001$), recurrence ($P < .001$), and pain ($P < .05$). The main factors influencing QoL were age ($P = .008$), education level ($P < .001$), average monthly income per capita of the family ($P < .001$), recurrence ($P < .001$), and pain ($P < .01$).

Conclusions • Patients who undergo chemotherapy for PC experience a low-to-medium level of spiritual well-being and a medium level of QoL. The detrimental factors include: (1) being middle-aged, (2) having a low education level, (3) having a low family income, (4) suffering a recurrence of the disease, and (5) experiencing moderate-to-severe pain. Medical practitioners should provide extra care and support to protect the spiritual well-being of these patients and ultimately improve their QoL. (*Altern Ther Health Med.* 2023;29(7):404-411).

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Pancreatic cancer (PC) is one of the most malignant digestive cancers, characterized by a poor prognosis.¹ The Global Cancer Observatory's study found that 496 000 new cases

of PC occurred in 2020 worldwide, and about 125 000 new cases occurred in China, with 122 000 deaths.² Pancreatic ductal adenocarcinoma (PDAC) represents 90% of PC cases, and the five-year survival rate of PDAC patients is lower than 10%.³

Surgery is the only curative method, with only 20% of PC patients receiving conventional surgical resection.⁴ At present, the treatment strategy of pancreatic cancer has gradually changed from the traditional surgical resection to the comprehensive multi-dimensional treatment model based on surgical resection. New surgical methods and novel neoadjuvant chemotherapy have successfully improved and prolonged the survival of these patients, increase the R0 resection rate, reduce the positive rate of lymph nodes, delay tumor progression, effectively relieve abdominal and (or) low back pain, improve patients' quality of life, prolong overall

survival, and improve prognosis.⁵

Mohebbifar et al found that patients who receive an early diagnosis and proactive treatment are more confident in their treatment and future life and that they have better levels of mental health and quality of life than those who don't.⁶

However, PC chemotherapy patients can endure immense physical and psychological pain. Bauer et al found that compared with healthy adults or population norms, adults with pancreatic cancer had worse QoL across all domains, a high rate of mortality, and a high metastasis rate can impose a significant psychological burden on patients, negatively impacting spiritual well-being and QoL.⁷

Spiritual Well-being

Intolerable pain, social-role changes or loss, and a feeling of meaninglessness in life can threaten the spiritual well-being of dying patients.⁸ Spiritual well-being is essential for human health. It's a subjective feeling of happiness, which relates to an individuals' personal values and attitudes toward transcendent questions, includes management of interpersonal relationships with an open and accepting attitude, and involves inner coping abilities affecting happiness, comfort, and self-healing.⁹

Bovero et al found that the level of spiritual well-being for end-of-life cancer patients, measured using the total score on the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-sp), was 22.86 ± 6.35 , it means that the spiritual level of the patient is at an average level.¹⁰ Turan GB et al found a total score for FACIT-sp of cancer patients had moderate level of spiritual well-being and psychological resilience and high level of death anxiety¹¹ Gonzalez et al measured spiritual well-being using the FACIT-Sp scale's subdimension for spiritual well-being, FACIT-Sp-12, and found that Spiritual Well-Being is a valuable coping mechanism.¹²

PC chemotherapy patients' low scores may relate to having to endure both the disease's severe pain and the adverse effects of chemotherapy, such as gastrointestinal reactions and cancer-related fatigue. Tang et al and Watson al found that these patients tend to feel uncertain about their lives, lose a sense of the meaning of life, and experience spiritual distress, including anxiety and pessimism, as a result of the disease's rapid progression.^{13,14} High levels of spiritual well-being could improve the psychological state of cancer patients and encourage them to confront the illness proactively.^{15,16}

However, due to the differences in cultural and regional backgrounds, medical practitioners often overlook the spiritual well-being of PC chemotherapy patients in China.¹⁷ Also, developing interventions to increase spiritual well-being for PC chemotherapy patients is challenging for clinicians.

Eggers et al found that correctly identifying the level of spiritual well-being of late-stage PC patients can help them cope with their continuing inner struggles and conflicts about dying.¹⁸ Those researcher indicated use of the following methods: (1) setting up seminars to generate closer relationships between medical staff and patients; (2) providing

a comprehensive education for patients to allow them to correctly understand the disease and maintain inner peace; (3) assisting patients in developing and using psychologically related practices and services to keep themselves emotionally stable; and (4) identifying and actively intervening the spiritual distress of patients.

QoL Level

Some studies have found that PC survivors have a low quality of life (QoL).¹⁹⁻²³ Janda et al found that PC chemotherapy patients can experience a low QoL due to several factors, such as the hidden location of the pancreas in the body resulting in a late-stage diagnosis, rapid disease progression, poor nutritional status, physical discomfort, and the high cost of treatment.²⁴

Fleur van der Sijde found that PC chemotherapy patients had low scores for the physical and functional dimensions of QoL on the FACT-G, part of the FACIT-Sp. Quality of life in cancer patients might be affected by chemotherapy-induced toxicity.²⁵ El Jabari et al found that Pakistani cancer patients undergoing chemotherapy emotional well-being scored the lowest whereas social/family well-being scored the highest.²⁶ The differences in the findings of those two studies may be related to diverse cultural background and religious beliefs.

Spiritual Well-being and QoL

Al-Natour et al and Taghavi et al found a significant positive correlation between spiritual well-being and QoL for PC chemotherapy patients.^{27,28} High-level spirituality may keep patients feeling meaningful and enable them to cope with adverse events with optimism, which can improve their QoL.

Particularly the domain of social and family status for QoL can affect its relationship to spiritual well-being. Harmonious family dynamics and positive social relationships can allow patients to experience a high sense of security, belonging, and overall well-being. Li et al found that this dimension can have a positive impact on patient's physical, psychological, and spiritual health, ultimately promoting a high QoL.²⁹

It's essential for PC chemotherapy patients to have stable family-and-social support systems as well as to receive active interventions in physical, mental, social, and spiritual aspects.

Possible Influencing Factors

Age. PC patients experience a significant decline in physical function and often face both physical and psychological challenges.³⁰ While patients between 60 and 74 years old are often retired, have accumulated rich life experiences, and may have developed a more peaceful mindset, people under 60 are primarily in the working stage of life, with heavy family and psychological burdens. The disease can pose a threat to their social roles, work statuses, and incomes, which can cause significant psychological distress, questioning of life's purpose, and lower levels of spiritual well-being.

Periodic adjuvant chemotherapy can exacerbate negative emotions, such as anxiety, fear, and worry about uncertain outcomes, which can lower QoL. Clinicians should consider

the different needs of patients who are under 60 years of age. Clinicians should provide personalized disease-related care, psychological guidance, and spiritual care to improve their levels of spiritual well-being and QoL.

Education level. Masha'al et al found that high levels of education could positively affect spiritual well-being and QoL,³¹ but Pahlevan et al found that the opposite, education weakened the relationship between spirituality with quality of life and stress.³² One possible explanation is that patients with high levels of education may have a greater understanding and awareness of their illness. They may be more adept at using cultural and social resources to cope with various situations and may be more likely to seek social and emotional support to achieve spiritual comfort and psychological well-being.

Conversely, patients with low levels of education may have poorer awareness and knowledge of their conditions. They may be more susceptible to negative emotions, such as anxiety and fear, and more easily influenced by external factors.

To ensure effective communication with and improved levels of well-being for PC patients with low levels of education, healthcare providers should focus on individualized spiritual interventions that enhance their acceptance and awareness of their conditions, promote compliance with treatment regimens, and foster overall spiritual well-being and QoL.

Household monthly income. Patients with high monthly household incomes have a lower economic burden in treating their illnesses, which can allow them to choose the best treatment plan without worrying about financial issues or treatment interruptions. Therefore, they also may experience fewer negative emotions. On the other hand, PC patients with low monthly household incomes face heavier economic burdens and may have little energy to meet their psychological and spiritual needs.

Clinicians should consider the financial limitations of PC patients from low-income households and avoid imposing additional economic burdens on them. Rather than placing further financial strain on these patients, clinicians should guide them in recognizing the importance of life and also provide appropriate support.

Recurrence status. Patients with recurrent PC receiving chemotherapy may experience lower levels of spiritual well-being and QoL compared to those without recurrence. At present, the primary focus of research on recurrent PC is on identifying factors that influence recurrence and predicting risks, with comparatively little attention paid to investigating the QoL and spiritual well-being of these patients.

Patients with recurrent PC often experience prolonged physical and psychological pain during treatment. The disease's persistent progression can lead to feelings of hopelessness and worthlessness, making it challenging to maintain a positive outlook on life. Given the high likelihood of psychological and spiritual distress in patients with recurrent PC undergoing chemotherapy, it's crucial for healthcare professionals to prioritize comprehensive evaluations and interventions to support their well-being.

Pain. PC causes severe physical pain, and 50% to 70% of

PC patients experience such pain,³³ and PC patients have difficulty managing pain.³⁴ Continuous pain can have severe consequences, including fatigue, low mood, and interruptions to cancer treatment, or even suicidal thoughts, which can severely affect QoL and spiritual well-being of these patients.³⁵

Clinicians should provide diverse pain knowledge and health education to PC chemotherapy patients. The concept of rapid rehabilitation is to use various methods before and after surgery to reduce the stress and complications of surgery and to promote recovery from the condition. It may be helpful in reducing the incidence of moderate to severe pain. This can be achieved through various pain management measures such as multimodal analgesia and mindfulness meditation.

Current Study

Currently, interest has risen about spiritually related research. To the best of the current research team's knowledge, however, no research has occurred for palliative-care assessment and interventions related to the spiritual well-being of PC chemotherapy patients.

The current study intended to investigate PC patients' statuses regarding spiritual well-being and QoL, to identify and analyze the influencing factors, and to develop feasible spiritual-care plans, which could provide a reference for clinicians in promoting the spiritual well-being and QoL of PC chemotherapy patients.

METHODS

Participants

The research team was a member of the medical staff of the Second Affiliated Hospital of Army Medical University in Chongqing, China, and conducted a prospective investigation in the hospital. Potential participants are PC patients who received chemotherapy at the hospital between November 2020 and April 2022.

The study included potential participants if they: (1) were aged ≥ 18 and < 80 years, (2) had histologically confirmed PC and were undergoing periodic chemotherapy, (3) had an expected survival of at least six months, and (4) had the ability to read and understand a questionnaire independently or with the assistance of a researcher.

The study excluded potential participants if they: (1) had PC concurrent with other cancers or (2) had a mental illness or cognitive impairment.

The research team distributed 132 questionnaires. A total of 120 valid questionnaires were collected, with an effective recovery rate of 91%. Which included demographic and clinical questions, as well as a scale measuring spiritual well-being and QoL, to potential participants.

The research team informed participants and their families about the study's purpose and significance. All participants signed informed-consent forms. The Ethics Committee of the Second Affiliated Hospital of Army Medical University (2021-Yandi161-01) approved the study's protocols, in accordance with the Declaration of Helsinki.

Procedures

Sampling. The research team used the convenience sampling methods. In the course of investigation, the investigator shall determine the units to be included in the sample according to the principle of convenience of the Second Affiliated Hospital of Army Medical University.

Data collection. After obtaining permission from the hospital's ethics committee for the study, the researchers conducted a preliminary survey of 11 PC chemotherapy patients between April and July 2020 who met the inclusion criteria. The research team calculated the Cronbach's α coefficient of the scales afterward to assess the internal consistency of the portion of the survey that was the self-designed demographic and clinical questionnaire.

For the full study, members of the research team collected all data, with participants completing the questionnaires immediately after their most recent chemotherapies. All of the surveys' contents were confidential.

The participants independently completed the questionnaires, or members of the research team assisted them. If participants found questions to be unclear, team members explained them. The team distributed and collected all questionnaires on-site in case of omissions or other problems. If participants find that there is confusion about the contents of the questionnaire, the team members explain the contents of the questionnaire. Team members will distribute and collect all questionnaires on-site.

Demographic and clinical questionnaire. The research team designed a questionnaire to collect basic information about participants, which included 12 demographic and clinical characteristics: gender, age, education level, occupation, monthly per capita income of patients' families, marital status, religious beliefs, number of children, medical-expenditure payment method, time of diagnosis, recurrence of the disease, and score on a numeric rating scale (NRS) for pain.^{36,37}

Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp).³⁸ The questionnaire consists of two subscales: (1) Functional Assessment of Cancer Therapy-General (FACT-G), and (2) the FACIT-Sp-12, measuring spiritual well-being. The FACIT-Sp has good reliability and validity.³⁸ The S-CVI score of the FACIT-Sp is 0.90. The Cronbach's α coefficient of the questionnaire is 0.831.

The two subscales contain seven dimensions with 39 items. The Cronbach's α coefficients of the Chinese version of the FACT-G are greater than 0.8. The negative items are reverse-scored—GP1GP7, GE1, and GE3GE6.

The Cronbach's α coefficients of the Chinese version of the FACIT-Sp-12 range from 0.711 to 0.920. Sp8 is a negative item. and the scoring formula is the same as that for the FACT-G.

Outcome measures. The outcome measures included: (1) a self-designed questionnaire to identify participants' demographic and clinical characteristics and (2) the FACIT-Sp. The research team used the FACIT-Sp's two subscales, FACT-G and FACIT-Sp-12, to evaluate the participants' quality of life (QoL) and spiritual well-being, respectively.

Outcome Measures

Spiritual well-being. The FACIT-Sp-12 includes three dimensions: faith—items 1, 4, 6, 7, meaning—items 2, 3, 5, 8, and peace—items 9, 10, 11, 12. The scale has 12 items, rated on a 5-point Likert scale: 0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, and 4 = very much. A total score of ≥ 36 indicates a high level, 24-35 indicates a medium level, and < 24 indicates a low level of spiritual well-being.

QoL. The FACT-G measures QoL, including physical, social-and-family, emotional, and functional dimensions. The scale has 27 items, rated on a 5-point Likert scale: 0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, and 4 = very much.

The team calculated the score and identified a positive score for an item as = 0 + the participant's score for his or her response to an item and a negative score for an item as = 4 - the participant's score for the item. The higher the total score, the better the QoL.

Statistical Analysis

The research team analyzed the data using Statistical Product and Service Solutions (SPSS) 22.0 statistical software (IBM, Armonk, NY, USA). The team: (1) expressed counting data as frequencies (N) and percentages (%) and used one-way analysis of variance to compare groups and (2) expressed measurement data as means \pm standard deviations (SDs) and used independent sample *t* tests to compare the means between two groups. The team used: (1) Pearson correlation analysis to analyze the relationship between QoL and spiritual well-being and (2) multiple linear regression analysis to identify the influencing factors. $P < .05$ indicated statistical significance.

RESULTS

Preliminary Survey

The Chinese version of the FACIT-Sp scale showed a Cronbach's α coefficient of 0.933. Additionally, the subscales FACT-G and FACIT-Sp-12 showed Cronbach's α coefficients of 0.873 and 0.916, respectively.

Participants and FACIT-Sp

The research team received 120 valid responses for the questionnaire, with an effective recovery rate of 91%. The team included and analyzed the data of the 120 PC chemotherapy patients (Table 1). The study included 79 males (65.83%) and 41 females (34.17%). Of the 120 participants, 16 were aged 18-44 (13.33%); 66 were aged 45-59 (55.00%); 31 were aged 60-74 (25.83%); and seven were aged 75-80 (5.84%).

Of the 120 participants, 31 had a basic or elementary education (25.83%); 71 had a primary or high school education (59.17%); 9 attended junior college (7.50%); and 9 had a college education or above (7.50%). For occupation, 60 participants were farmers (50.00%); 28 were retired (23.33%); 18 were staff (15.00%); and 14 had other occupations (11.67%).

For average monthly family income, 32 participants had an income of < 1000 RMB (26.67%); 27 an income ≥ 1000 but

Table 1. The Spiritual Well-being and QoL Scores

Characteristics		Participants n = 120 n (%)	Spiritual Well-being			QoL		
			Score Points Mean ± SD	F/t	P value	Score Points Mean ± SD	F/t	P value
Gender	Male	79 (65.83)	26.49 ± 5.08	.803	.423	66.34 ± 15.74	1.062	.290
	Female	41 (34.17)	25.65 ± 5.96			62.92 ± 18.43		
Age	18-44	16 (13.33)	24.06 ± 3.97	2.778	.44 ^a	61.50 ± 15.15	3.264	.024 ^a
	45-59	66 (55.00)	26.85 ± 6.51			64.78 ± 16.50		
	60-74	31 (25.83)	28.16 ± 5.85			68.80 ± 16.57		
	75-80	7 (5.84)	23.06 ± 5.12			62.42 ± 21.60		
Education Level	Basic, elementary	31 (25.83)	22.83 ± 5.24	9.129	.000 ^b	56.00 ± 15.82	6.661	.000 ^b
	Primary, high school	71 (59.17)	26.71 ± 4.61			66.83 ± 16.76		
	Junior college	9 (7.50)	28.66 ± 5.12			73.44 ± 13.14		
	College or above	9 (7.50)	31.33 ± 5.95			79.00 ± 12.34		
Occupation	Farmer	60 (50.00)	24.06 ± 4.76	8.306	.000 ^b	60.30 ± 15.57	4.437	.005 ^b
	Retired	28 (23.33)	29.21 ± 6.04			72.20 ± 18.46		
	Staff	18 (15.00)	28.33 ± 3.69			71.77 ± 14.20		
	Others	14 (11.67)	26.64 ± 4.73			65.78 ± 18.34		
Average Monthly Family Income, RMB	<1000	32 (26.67)	22.84 ± 5.27	14.910	.000 ^b	54.93 ± 16.46	12.103	.000 ^b
	≥1000 but <3000	27 (22.50)	24.22 ± 3.06			60.62 ± 14.34		
	≥3000 but <5000	45 (37.50)	28.22 ± 4.98			71.20 ± 16.53		
	≥5000	16 (13.33)	30.62 ± 4.47			78.37 ± 7.36		
Married	Yes	102 (85.00)	26.94 ± 5.13	3.730	.953	67.90 ± 14.90	4.601	.105
	No	18 (15.00)	22.05 ± 5.03			49.70 ± 18.30		
Religion	With	4 (3.33)	24.50 ± 2.38	-0.643	.352	57.50 ± 9.00	-0.943	.522
	Without	116 (96.67)	26.26 ± 5.46			65.40 ± 16.87		
Children, n	0	2 (1.67)	23.00 ± 7.07	2.283	.083	57.00 ± 22.62	1.339	.265
	1	58 (48.33)	27.44 ± 5.65			68.50 ± 18.13		
	2	48 (40.00)	24.89 ± 4.17			62.29 ± 14.92		
	≥3	12 (10.00)	26.00 ± 7.22			64.66 ± 19.09		
Medical Expenditure Payment Method	Employee medical insurance	48 (40.00)	28.54 ± 4.46	5.798	.001 ^b	72.10 ± 15.31	4.818	.003 ^b
	New rural cooperative medical system	63 (52.50)	24.81 ± 4.92			61.57 ± 16.37		
	Urban employee basic medical insurance	4 (3.33)	24.25 ± 11.75			52.70 ± 26.12		
	Others	5 (4.17)	23.00 ± 6.20			60.20 ± 18.3		
Confirmed Periods for PC	≤6 months	58 (48.33)	26.25 ± 5.66	0.597	.618	66.37 ± 17.05	0.282	.838
	7-12 months	32 (26.67)	27.00 ± 5.81			63.31 ± 19.53		
	13-24 months	13 (10.83)	25.75 ± 4.15			67.38 ± 13.47		
	≥24 months	17 (14.17)	24.88 ± 4.15			64.76 ± 15.97		
Recurrence	Yes	24 (20.00)	22.87 ± 4.80	-3.546	.001 ^b	55.33 ± 16.09	-3.362	.001 ^b
	No	96 (80.00)	27.04 ± 5.22			67.63 ± 16.02		
NRS Pain Score	0-3	46 (38.33)	28.04 ± 5.06	3.039	.003 ^b	72.21 ± 13.93	3.784	.000 ^b
	≥4	74 (61.67)	25.07 ± 5.31			61.23 ± 17.66		

^a*P* < .05, indicating that age significantly affected participants’ spiritual well-being and QoL

^b*P* < .01, indicating that education level, occupation, average monthly family income, (5) method of medical-expense payment, marital status, recurrence of PC, and pain significantly affected participants’ spiritual well-being and QoL

Abbreviations: NRS, numeric rating scale; QoL, quality of life; RMB, Renminbi—Chinese Currency.

<3000 RMB (22.50%); 45 an income ≥3000 but <5000 RMB (37.50%); and 16 an income ≥5000 RMB (13.33%).

For marital status, 102 were married (85.00%), and 18 weren’t (15.00%) For method of medical-expense payment, 48 participants had employee medical insurance (40.00%); 63 had insurance through a new rural cooperative medical system (52.50%); 4 had basic medical insurance for urban employees (3.33%); and 5 had other methods of payment (4.17%).

For recurrence of PC, 24 cooperative had had a recurrence (20.00%) and 96 hadn’t (80.00%). For pain on the NRS, 46 had scores of 0-3 (38.33%), and 74 had scores of ≥4 (61.67%)

Spiritual Well-being and QoL

Participants’ mean overall score for spiritual well-being was 26.2 ± 5.39, with 38 participants (31.7%) scoring at the low level, 75 (62.5%) at the medium level, and 7 (5.8%) at the high level (data not shown). Participants’ mean scores for the belief, meaning, and peace dimensions were 9.15 ± 1.66, 7.36 ± 1.63, and 9.71 ± 2.50 points, respectively (data not shown).

Participants’ mean overall score for QoL was 65.44 ± 17.1 (data not shown). The scores for physical condition, social and family condition, emotional condition, and functional status were 16.05 ± 5.4, 17.14 ± 5.37, 16.68 ± 3.6, and 15.56 ± 3.52, respectively (data not shown).

Table 2. Results of Pearson Correlation Analysis Between Spiritual Well-being and QoL (R-value)

QoL Measures	Dimensions of Spiritual Well-being					Overall Score		
	Faith, Spiritual or Religious	P value	Meaning or Purpose	P value	Peace	P value	Spiritual Well-being	P value
Physical score	0.792	.000 ^a	0.795	.000 ^a	0.846	.000 ^a	0.884	.000 ^a
Social/family score	0.782	.000 ^a	0.809	.000 ^a	0.870	.000 ^a	0.897	.000 ^a
Emotional score	0.733	.000 ^a	0.683	.000 ^a	0.723	.000 ^a	0.777	.000 ^a
Functional score	0.686	.000 ^a	0.651	.000 ^a	0.716	.000 ^a	0.746	.000 ^a
Total QoL score	0.790	.000 ^a	0.782	.000 ^a	0.839	.000 ^a	0.877	.000 ^a

^a*P* < .01, indicating that the total QoL score and the four individual QoL scores were significantly related to overall spiritual well-being and its three subdimensions

Abbreviations: QoL, quality of life.

Table 3. Categories of Variables for Multiple Linear Regression

Variables	Categories
Age	<ul style="list-style-type: none"> • Lower or equal to 60-year-olds = 1 • Above 60-year-olds = 2
Education level	<ul style="list-style-type: none"> • Lower or equal to elementary school = 1 • Primary or high school = 2 • Junior college = 3 • University or above = 4
Occupation	<ul style="list-style-type: none"> • Farmer = 1 • Retired = 2 • Staff = 3 • Others = 4
Average monthly family income	<ul style="list-style-type: none"> • <1000 RMB = 1 • ≥1000 but <3000 RMB = 2 • ≥3000 but <5000 RMB = 3 • ≥5000 RMB = 4
Medical expenditure payment method	<ul style="list-style-type: none"> • Employee medical insurance = 1 • New rural cooperative medical system = 2 • Urban employee basic medical = 3 • Others = 4
Recurrence	<ul style="list-style-type: none"> • Yes = 1 • No = 2
NRS pain score	<ul style="list-style-type: none"> • 0-3 = 1 • ≥4 = 2

Abbreviations: NRS, numeric rating scale; RMB, Renminbi—Chinese Currency.

Significant Characteristics

Participants’ scores for spiritual well-being and QoL were significantly different for seven characteristics: (1) age—*P* = .44 and *P* = .024, respectively; (2) education level—*P* = .000 and *P* = .000, respectively; (3) occupation—*P* = .000 and *P* = .005, respectively; (4) average monthly family income—*P* = .000 and *P* = .000, respectively; (5) method of medical-expense payment—*P* = .001 and *P* = .003, respectively; (6) recurrence—*P* = .001 and *P* = .001, respectively; and (7) pain—*P* = .003 and *P* = .000, respectively.

The research team identified those factors as potential contributors to participants’ level of spiritual well-being and QoL.

Pearson Correlation Analysis

Table 2 shows that the total QoL score and the four individual QoL scores—physical, social and family, emotional, and functional—were significantly positively correlated with total spiritual well-being and its three subdimensions—faith, meaning, and peace: (1) physical score and total score for spiritual well-being (*P* < .01); (2) physical score and faith (*P* < .01); (3) physical score and meaning (*P* < .01); (4) physical score and peace (*P* < .01); (5) social/family score and total score for spiritual well-being (*P* < .01); (6) social/family score and faith (*P* < .01); (7) social/family score and meaning (*P* < .01); (8) social/family score and peace (*P* < .01); (9) emotional score and total score for spiritual well-being (*P* < .01); (10) emotional score and faith (*P* < .01); (11) emotional score and meaning (*P* < .01); (12) emotional score and peace (*P* < .01); (13) functional score and total score for spiritual well-being (*P* < .01); (14) functional score and faith (*P* < .01); (15) functional score and meaning (*P* < .01); (16) functional score and peace (*P* < .01); (17) total QoL score and total score for spiritual well-being (*P* < .01); (18) total QoL score and faith (*P* < .01); (19) total QoL score and meaning (*P* < .01); and (20) total QoL score and peace (*P* < .01).

Multiple Linear Regression Analysis

The research team used the scores for spiritual well-being and QoL as dependent variables in the multiple linear regression analysis. The team selected the statistically significant factors from the univariate analysis as the independent variables. Table 3 shows the categories for the independent variables that the research team used for the multiple linear regression analysis.

Age, education level, average monthly family income, recurrence status, and pain significantly influenced participants’ spiritual well-being, with *P* < .01, *P* < .001, *P* < .001, *P* < .001, and *P* < .05, respectively. Age, education level, average monthly family income, recurrence status, and pain also significantly influenced participants’ QoL, with *P* = .008, *P* < .001, *P* < .001, *P* < .001, and *P* < .01, respectively;

These variables accounted for 53.6% of the variation in spiritual well-being and 46.1% of the variation in QoL (data not shown).

Table 4. Multiple Linear Regression Analysis Results of Spiritual and QoL. Spiritual Well-being, $R^2 = 0.556$, adjusted $R^2 = 0.536$, $F = 28.516$, $P < .001$; QoL, $R^2 = 0.4$, adjusted $R^2 = 0.461$, $F = 21.378$, $P < .001$.

Dependent Variables	Independent Variables	B value	SE value	β value	<i>t</i>	<i>P</i> value
Spiritual Well-being	(Constant)	3.482	3.283	-	1.061	.291
	Age	1.467	0.500	0.206	2.934	<.01 ^b
	Education level	2.981	0.507	0.441	5.882	<.001 ^c
	Average monthly family income	1.952	0.356	0.370	5.484	<.001 ^c
	Recurrence	5.626	0.877	0.419	6.417	<.001 ^c
	NRS pain score	-1.644	0.706	-0.149	-2.330	<.05 ^a
QoL	(Constant)	12.552	11.239	-	1.117	.266
	Age	2.044	1.712	0.090	1.194	.008 ^b
	Education level	7.362	1.735	0.343	4.243	<.001 ^c
	Average monthly family income	6.286	1.219	0.375	5.159	<.001 ^c
	Recurrence	16.162	3.001	0.379	5.385	<.001 ^c
	NRS pain score	-7.569	2.416	-0.216	-3.133	<.01 ^b

^a $P < .05$, indicating that the NRS pain score was significantly correlated with spiritual well-being

^b $P < .01$, indicating that age was significantly correlated with spiritual well-being and that age and the NRS pain score were significantly correlated with QoL

^c $P < .001$, indicating that education level, average monthly family income, and recurrence of PC was significantly correlated with spiritual well-being and QoL

Abbreviations: NRS, numeric rating scale; QoL, quality of life.

DISCUSSION

The current study found that participants' overall level of spiritual well-being was at a low-to-medium level. The current study's mean FACIT-sp total score of 26.10 ± 6.93 was consistent with those reported by Turan GB et al,¹¹ but higher than those of Bovero et al.'s study.¹⁰ The meaning score related to spiritual well-being was the lowest one of all the dimensions, at 7.36 ± 1.63 , and was lower than that reported by Gonzalez et al.¹²

In the current study, the overall score for QoL was 65.44 ± 17.1 , which is at a moderate level. Participants had low scores in the physical and functional dimensions, which is similar to the findings of Fleur van der Sijde²⁵ but higher than those that El Jabari found.²⁶

The analysis of the correlation between participants' spiritual well-being and QoL demonstrated a significant positive correlation between the total QoL score and the total score for spiritual well-being ($r = 0.877$, $P < .01$). These findings are consistent with those of Al-Natour et al²⁷ and Taghavi et al.²⁸ Simultaneously, a positive correlation existed between each dimension of spiritual well-being and QoL, particularly in the domain of social and family status ($r = 0.897$, $P < .01$).

The multiple linear regression analysis revealed that age was the primary predictor of participants' spiritual well-being ($B = 1.467$, $P < .01$) and QoL ($B = 2.004$, $P = .008$). Specifically, a higher age was positively associated with better spiritual well-being and QoL. Among the age groups, participants between 60 and 74 years old showed the highest levels of spiritual well-being and QoL.

Level of education was also a significant factor in the current study in determining participants' spiritual well-being ($B = 2.981$, $P < .001$) and QoL ($B = 7.362$, $P < .001$).

Participants with higher levels of education exhibited higher levels of spiritual well-being and QoL. Participants' monthly household income was also a major influencing factor for participants' spiritual well-being ($B = 1.952$, $P < .001$) and QoL ($B = 6.286$, $P < .001$). The higher the monthly household income, the better was their spiritual well-being and QoL.

The current study also revealed that the recurrence of PC was a significant factor that affected participants' spiritual well-being ($B = 5.626$, $P < .001$) and QoL ($B = 16.162$, $P < .001$). The current study also found that pain was a critical contributing factor to low levels of spiritual well-being ($B = -1.644$, $P < .05$) and QoL ($B = -7.569$, $P < .01$).

Clinicians should prioritize the spiritual well-being and QoL of middle-aged PC patients with lower levels of education, lower average monthly household income, disease recurrence, and moderate to severe pain. Accurate and prompt assessment of their spiritual well-being is essential. Clinicians should provide appropriate spiritual support and care to enhance their confidence in overcoming the disease and affirm the meaning and value of their lives.

The current study had some limitations. It's important to note that the study included only patients from one tertiary hospital in Chongqing, and the lack of multicenter and multisample data limits its generalizability. Therefore, future research should expand the scope of the investigation to provide a more comprehensive understanding of the factors that affect spiritual well-being and QoL in PC chemotherapy patients. This information will be useful for clinicians to implement spiritual care and develop effective intervention strategies.

CONCLUSIONS

PC Patients who undergo chemotherapy experience a low-to-medium level of spiritual well-being and a medium

level of QoL. The detrimental factors include: (1) being middle-aged, (2) having a low education level, (3) having a low family income, (4) suffering a recurrence of the disease, and (5) experiencing moderate-to-severe pain. Medical practitioners should provide extra care and support to protect the spiritual well-being of these patients and ultimately improve their QoL.

AUTHORS' DISCLOSURE STATEMENT

The authors have no potential conflicts of interest to report relevant to the study.

AUTHOR CONTRIBUTIONS

Yan Yu and Yu Liao contributed equally to this work.

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