Spiritual care needs attributes among hospitalized patients with breast cancer based on Kano model approach: a descriptive cross-sectional study

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Research Article

Keywords: Kano model, Breast cancer, Hospitalized patient, Spiritual care needs, Attributes

Posted Date: May 18th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1641253/v1

Abstract

Purpose To qualitatively analyze spiritual care needs attributes among hospitalized patients with breast cancer based on Kano model approach, in order to provide a reference for formulating intervention measures to meet their spiritual care needs.

Methods A descriptive design was implemented, and the STROBE Checklist was used as the foundation of the study. The sociodemographic characteristics questionnaire, and an questionnaire on spiritual care needs attributes among hospitalized patients with breast cancer based on Kano model approach were used. A total of 357 hospitalized patients with breast cancer from three tertiary grade-A hospitals in China were investigated by using convenience sampling. Descriptive, maximum frequency, importance-satisfaction matrix, and blue-sea strategy analyses were used to analyze the data.

Results Among the 12 items of spiritual care needs among hospitalized patients with breast cancer, 3 items (25.0%) were attractive attributes, all of which were located in reserving zone IV; 5 items (41.7%) were one-dimensional attributes, of which 3 were located in predominance zone I, 2 were located in improving zone II; 2 items (16.7%) were must-be attributes, all of which were located in improving zone II; 2 items (16.7%) were indifference attributes, all of which were located in secondary improving zone III.

Conclusion The must-be and one-dimensional attributes of spiritual care needs among 357 hospitalized patients with breast cancer mainly focus on creating a good atmosphere and sharing self-perception dimensions, while attractive attributes of needs mainly focus on sharing self-perception and helping thinking dimensions. It is suggested that hospital managers should develop and innovate attractive attributes of needs on the basis of maintaining and perfecting must-be and one-dimensional attributes of needs, and objectively analyze and optimize indifference attributes of needs.

1 | Introduction

Breast cancer is the most common cancer in women worldwide. According to the 2018 global cancer statistics report, the global incidence of breast cancer is 2.1 millions, accounting for 24.2% of female cancer incidence and 15.0% of the total number of deaths [1, 2]. The number of new cases of female breast cancer in China is 279,000, accounting for 16.5% of female cancers and ranking the first in female cancers [3]. The treatment methods of breast cancer mainly include surgery, radiotherapy, chemotherapy, targeted therapy and endocrine therapy. One or more combination of diagnosis and treatment schemes have inevitable side effects, and the treatment cycle is longer, which brings a series of damages to health and greatly affects the quality of life [4, 5]. Although the life cycle of breast cancer is continuously extended with the continuous improvement of medical level, breast cancer patients still suffer from severe physical and mental pain caused by the disease in the treatment and rehabilitation period. With that passage of time of treatment, the patient still need to continuously bear the huge social, psychological and spiritual burden caused by the damage of body image, changing role, influencing sexual life and worry about cancer recurrence [6, 7]. Therefore, patients with breast cancer are eager to find spiritual sustenance, gain hope, love, forgiveness and strength, understand the significance and value of life and overcome the pain and dilemma, i.e., spiritual care needs [8]. In addition, there is ample evidence that spirituality plays a vital role in the treatment of breast cancer patients and in the promotion of overall health by

providing them with inner strength, peace and comfort as a way to cope with cancer during their diagnosis, treatment and rehabilitation [9–11].

Spirituality, originated from the Latin "spiritus", which means breathing, representing an indispensable part of life [12]. The National Consensus Project for Quality Palliative Care (NCP) clinical practice guidelines for high-quality hospice care pointed out that spirituality is a way for people to find and express the meaning and purpose of life, and also a way to experience the connection between self and the present, others, god, the natural environment and beliefs [13]. Spiritual care meets the spiritual needs of patients through listening, accompanying or discussing the meaning and value of life with patients according to the assessment results of individual spiritual needs/troubles, including helping patients to find the meaning and purpose of life, giving love and forgiveness, and obtaining internal and external resources. It enables patients to obtain peace and comfort and provides individual care measures or activities consistent with their culture and beliefs [14–16]. At present, the definition of spiritual care needs has not been unified, and the most common definition currently used is that it refers to the expectation and need of everyone to find the meaning, value and purpose of life, as well as the need to understand their connection with the present, self, others, god/holiness, faith and nature [17, 18].

The Practice Guide for Hospice Care (for Trial Implementation) (2017) in China points out that hospice care should include providing spiritual care for patients [19]. It has been proposed in many studies that spirituality is the cornerstone of holistic nursing practice, and that the assessment of patients' spiritual care needs is the first step in developing targeted intervention programs for them [20–22]. Many studies abroad have shown that spiritual care for patients with advanced cancer and meeting their spiritual care needs are conducive to alleviating pain, relieving discomfort, promoting recovery and prolonging life expectancy [14, 23–25]. Research by Weathers et al. [26] has shown that providing supportive spiritual care with connectivity, transcendence and life significance and addressing spiritual care needs is important component of implementing high-quality spiritual care for patients. The results of a qualitative research conducted by Wang et al. [27] showed that spiritual care based on spiritual needs and distress can promote patients with advanced cancer to establish good interpersonal relationships, obtain emotional support and relieve inner fears and contradictions. In addition, Michael et al. [28] found that improve the needs of spiritual dimension can increase the quality and satisfaction of holistic care. However, for breast cancer patients who have suffered from the special physical and mental effects of cancer for a long time, their need for spiritual care may be more intense [29].

As the incidence of breast cancer increases and continuously prolongation of survival time, relevant studies on the spiritual care needs of breast cancer patients overseas are increasing. A qualitative study by Devi et al. [11] found that transcending experience, meaning and purpose, and changing views are common expressions of spiritual care needs of newly diagnosed breast cancer patients in Singapore. Research by Lynn et al. [30] showed that breast cancer patients believe that through spirituality and religion (including attending religious ceremonies, prayers, worship and reading the Bible, etc.), they can get comfort, encouragement and strength to help them cope with the pain during diagnosis and treatment. A qualitative study by Phenwan et al. [31] found that the sense of life value, collective belonging and natural connection were the connotations of patients' spiritual happiness. Park et al. [32]demonstrated that spirituality of breast cancer survivors can promote the formation of healthy behaviors of patients through a variety of ways, thus positively affecting the health outcomes of patients. Fallah et al. [33] found that the integration of spiritual care into group psychological

intervention could significantly improve the happiness, hope level and life satisfaction of breast cancer patients. Jafar et al. [34] performed spiritual intervention for breast cancer patients based on the Iranian cultural background, and the results showed that the mental well-being of the patients was effectively improved, and the quality of life was significantly improved.

At the same time, many studies in China have also revealed that there is a widespread spiritual care needs for breast cancer patients [35–37]. However, due to the differences in religious beliefs, traditional cultures, and values between the East and the West, the unique spiritual care model suitable for China's national conditions is still under continuous exploration. Many reasons together limit the improvement of nurses' spiritual care perspectives and competence, resulting in the mismatch with patients' spiritual care needs, and the ineffective satisfaction of their spiritual care needs [38]. Additionally, in terms of research methods, the qualitative research was mainly adopted in the domestic research on the spiritual care needs of breast cancer patients. Besides, the existing research contents in China and abroad mainly focused on the analysis of the status quo of the spiritual care needs scores, and few studies have qualitatively explored the attributes of spiritual care needs of breast cancer patients by using analytical models, such as the Kano model. Kano model is a simple method to identify service need attributes, which is mainly used in service industry at first. It can identify the quality attributes of customer' s service need accurately. In recent years, some scholars in China and abroad have applied Kano model to the field of health care to determine patients' needs for medical and nursing services, which is of great significance to improve patients' satisfaction [39, 40]. The model is easy to operate, and can identify various quality attributes and conduct regular and qualitative analysis on attributes. Moreover, the empirical research results of Kano model in multiple fields showed that the classification of need attributes is of great significance for the satisfaction of needs [41, 42].

2 | Aims

The aims of this study are to qualitatively define, sort, classify and optimize spiritual care needs attributes among hospitalized patients with breast cancer based on Kano model approach, accurately identify the breakthrough point for improving the satisfaction degree of spiritual care, and provide a reference and direction for the construction of targeted spiritual care intervention programs, so as to improve the quality of spiritual care. (1) The maximum frequency statistics was used to define and sort spiritual care needs attributes; (2) An importance-satisfaction matrix analysis model (IPA) was used to analyze importance and satisfaction of spiritual care needs and to classify attributes; (3) The blue-sea strategy analysis model was used to optimize spiritual care needs attributes.

3 | Methods

3.1 | Study design and setting

A descriptive design was employed, and the equator checklist document used in this study was issued by Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).

3.2 | Participants and sample

The convenience sampling was used to recruit hospitalized patients with breast cancer from three tertiary grade-A hospitals in China. Respondents met the following criteria respectively. Inclusion criteria: (1) Hospitalized patients diagnosed with breast cancer based on pathological examination; (2) Age of ≥ 18; (3) Being able to communicate effectively and complete questionnaires independently or with help; (4) Informed consent and voluntary participation. Exclusion criteria: (1) Complicated with other serious organic diseases can not cooperate with the investigation; (2) Being participating in similar research.

According to the determination principle of Hulland et al. [43] on the number of questionnaires for Kano model, the sample size should be greater than 10 times and greater than 200 of the items. The number of items in this study was 26, considering 10% invalid questionnaires, so the minimum sample size $N = (12\times10) \times (1 + 10\%) = 286$, and 357 sample sizes were included in this study.

3.3 | Data collection

Participants were recruited from three tertiary grade-A hospitals in China from January to May 2022. Firstly, the investigation was conducted with the prior approval of hospital administrators. And verbal and written consent was obtained from the participants who met the inclusion criteria. When the patients could not read the questions, the researchers helped the patients through reading the questions. The questionnaires were filled in approximately 5~10 min using a face-to-face interview and paper/pencil. The precaution was taken to protect the privacy of the participants, and only researchers have access to the data. Additionally, researchers recalled questionnaires on the spot, checked whether there was any defect, and made corrections in time. Finally, 357 valid questionnaires were collected.

3.4 | Theoretical basis

The theoretical basis in this study was Kano model. Kano model classifies quality attributes into six categories: one-dimensional attribute (O), must-be attribute (M), attractive attribute (A), indifference attribute (I), reversing attribute (R), and questioned answer (Q). Asking forward and reversing questions for each item, such as "If the hospital provided you with a spiritual care service, what do you think?" "If the hospital doesn't provide you with a spiritual care service, what do you think?". The responses were "like", "should be", "no matter", "bearable" and "dislike", and respondents could have 5×5 possible answer combinations, as shown in Table 1. In the importance-satisfaction matrix analysis model (IPA), the closer the importance (Worse index /DSI)= (M + O)/(A + M + O + I) was to "1", the greater the impact of spiritual care on the patients' importance would be. The closer the satisfaction (Better index/SI) = (A + O)/(A + M + O + I) was to "1", the greater the impact of spiritual care on the patients' satisfaction would be. According to the results of importance and satisfaction, a quadrant matrix was constructed with importance (DSI) as the vertical axis and satisfaction (SI) as the horizontal axis. The intersection value of the horizontal and vertical coordinates was "0", the endpoint value of the left and downward coordinates was "0", and the endpoint value of the right and upward direction was "1", which was divided into four regions: The predominance zone I, also known as competitive advantage zone; The improving zone II; The secondary improving zone III; The reserving zone IV, also known as the icing on the cake zone.

Table 1
The attributes classification of Kano model

Forward questions (If the hospital provides you with a spiritual care service, what do you think?)	Reversing questions (If the hospital doesn't provide you with a spiritual care service, what do you think?)				
	Like	Should be	No matter	Bearable	Dislike
Like	Q	A	A	A	O
Should be	R	I	I	I	M
No matter	R	I	I	I	M
Bearable	R	I	I	I	M
Dislike	R	R	R	R	Q

3.5 | Instruments

The sociodemographic characteristics questionnaire was developed by the researchers to identify the demographic, individual, socioeconomic characteristics of the patients in accordance with the literature, including 14 items, such as age, nationality, education level, religious beliefs and so on, as shown in Table 2.

Table 2
The sociodemographic characteristics of hospitalized patients with breast cancer (n = 357)

Characteristics	*n*	%
Age (years)		
<60	256	71.7
≥ 60	101	28.3
Nationality		
Han	328	91.8
Minority	29	8.2
Religion beliefs		
Yes	45	12.6
No	312	87.4
Marital status		
Unmarried	14	3.9
Married	283	79.3
Divorced	38	10.7
Widowed	22	6.1
Education level		
Primary school and below	69	19.3
Junior school	129	36.2
High school / Secondary school	102	28.7
Junior college and above	57	16.8
Residence place		
Cities	145	40.5
Towns	99	27.8
Rural area	113	31.7
Residence status		
Living alone	66	18.6
Living with others	291	84.1
Occupational status		
Be on the job	221	61.8

Characteristics	*n*	%
Not on the job	136	38.2
Monthly income per capita (RMB)		
<1000	48	13.4
1000~<3000	106	29.8
3000~<5000	129	36.2
≥ 5000	74	20.6
Medical payment methods		
Urban employee medical insurance	186	52.1
Urban and rural residents medical insurance	163	45.6
Others	8	2.3
Disease staging		
I	125	35.1
II	183	51.3
III	49	13.6
Diagnosis time (months)		
≤ 1	199	55.8
2~5	124	34.6
>5	34	9.6
Number of hospital admissions		
≤ 1	219	61.3
2~5	105	29.5
>5	33	9.2
Treatment		
Operation	112	31.5
Chemotherapy	47	13.3
Operation and chemotherapy	174	48.7
Operation and radiation therapy	9	2.4
Operation, chemotherapy and radiation therapy	15	4.1

The Kano model-based the Nurse Spiritual Therapeutics Scale was used to assess spiritual care needs attributes among hospitalized patients with breast cancer. The Nurse Spiritual Therapeutics Scale (NSTS) [44,

45] consists of 5 dimensions and 12 items, including sharing self-perception, helping thinking, creating a good atmosphere, exploring spiritual beliefs and helping religious practice. And the Cronbach's α was reported 0.792. The items in the scale, which is a 4-point Likert type, with the 1~4 scores indicating a range from "never" to "strongly". The total score of NSTS was 12~48, with a higher score indicating higher spiritual care needs. Based on the Kano model data collection method, the forward and reversing questions were asked on 12 items of the Nurse Spiritual Therapeutics Scale (NSTS) to form 24 questions, and a preliminary investigation was conducted on 30 hospitalized patients with breast cancer. The results showed that Cronbach's α coefficient of forward questionnaire was 0.873, and that of reversing questionnaire was 0.851.

3.6 | Statistical analysis

The raw data was recorded by two people using Epidata 3.1 software and checked, and the data was statistically analyzed by using SPSS 21.0 version program. The normality test, which is skewness, kurtosis and histograms, was used to examine whether the scores of numerical variables were normally distributed. Descriptive statistics were used to describe sociodemographic characteristics of participants. Kano model was used for qualitative analysis of attributes of spiritual care needs among hospitalized patients with breast cancer. (1) The maximum frequency statistics was used to define and sort spiritual care needs attributes; (2) An importance-satisfaction matrix analysis model (IPA) was used to analyze importance and satisfaction of spiritual care needs and to classify attributes; (3) The blue sea strategy analysis model was used to optimize spiritual care needs attributes.

3.7 | Ethical considerations

This is an observational and descriptive study. The Research Ethics Committee of Tianjin University of Traditional Chinese Medicine has confirmed that no ethical approval is required. After granting the official permission from hospital managers, the participants were approached by the researchers. A consent form for volunteer participation was completed by the participants. The participants were given the right to decide whether to participate in the study or not. Anonymity was ensured as the questionnaire contained no marks, names or numbers that could identify participants. The questionnaires were anonymous and confidential, and the data obtained is only used for academic research.

4 | Results

A total of 357 hospitalized patients with breast cancer were enrolled in this study, the age range from 25 to 78, with an average age of 42.51 ± 13.87. And 256 (71.7%) aged of <60, 101 (28.3%) aged of ≥ 60. And 328 (91.8%) were Han nationality, 312 (87.4%) had no religious beliefs. And other sociodemographic characteristics were shown in Table 2.

Among 12 items of spiritual care needs, 3 items (25.0%) were attractive attributes, all of which were located in reserving zone IV; 5 items (41.7%) were one-dimensional attributes, of which 3 were located in predominance zone I, 2 were located in improving zone II; 2 items (16.7%) were must-be attributes, all of which were located in improving zone II; and 2 items (16.7%) were indifference attributes, all of which were located in secondary improving zone III. Among five dimensions, in sharing self-perception, there were 2 attractive attributes (40.0%), 2 one-dimensional attributes (40.0%), 1 must-be attribute (20.0%). In helping thinking, there were 2 one-dimensional attributes (66.7%), 1 indifference attribute (33.3%). In creating a good atmosphere, there were 1

attractive attribute (50.0%), 1 must-be attribute (50.0%). In exploring spiritual beliefs, there was 1 one-dimensional attribute (100.0%). And in helping religious practice, there was 1 indifference attribute (100.0%), as shown in Table 3.

Table 3
The spiritual care needs attributes based on Kano model among hospitalized patients with breast cancer (n = 357)

Dimensions	Entries	Constituent proportions of attributes based on Kano model (*n*)						Kano attributes	Satisfaction (SI)	Importance (DSI)
		A	M	O	I	R	Q			
1 Sharing self-perception	1 Listen to me talk about my spiritual strengths.	263	42	40	8	3	1	A	0.85	0.23
	2 Listen to me talk about my spiritual concerns.	34	184	123	14	1	1	M	0.44	0.86
	3 Help me to think about my dreams.	237	66	52	2	0	0	A	0.81	0.33
	4 Teach me about ways to draw or write about my spirituality.	71	113	165	6	1	1	O	0.66	0.78
	5 Listen to the stories of my life.	95	56	201	3	1	1	O	0.83	0.72
2 Helping thinking	6 Ask me about religious practices.	73	41	48	193	2	0	I	0.34	0.25
	7 Offer to talk with me about meditation or.	38	103	129	83	3	1	O	0.47	0.65
	8 Ask me about what gives my life meaning.	54	115	149	36	2	1	O	0.57	0.74
3 Creating a good atmosphere	9 Bring me humorous things, eg: share a joke.	223	19	95	17	2	1	A	0.89	0.32

Dimensions	Entries	Constituent proportions of attributes based on Kano model (*n*)						Kano attributes	Satisfaction (SI)	Importance (DSI)
		A	M	O	I	R	Q			
	10 Help me to have quiet times or space.	61	218	71	6	1	0	M	0.37	0.81
4 Exploring spiritual beliefs	11 Ask me about my spiritual beliefs.	38	117	126	74	2	0	O	0.46	0.68
5 Helping religious practice	12 Help me, if I needed, with my religious practices.	71	53	15	217	1	0	I	0.24	0.19

Based on importance-satisfaction matrix analysis model (IPA), spiritual care needs attributes among hospitalized patients with breast cancer were analyzed, and the results showed that: There were 2 items of sharing self-perception, 1 item of helping thinking, and 1 item of creating a good atmosphere located in predominance zone I, and 3 (75.0%) items were one-dimensional attributes. And in improving zone II, there were 1 item of sharing self-perception, 1 item of helping thinking, and 1 item of exploring spiritual beliefs, and 2 (66.7%) items were must-be attributes. There were 1 item of helping thinking, and 1 item of helping religious practice located in secondary improving zone III, and 2 (100.0%) items were both indifference attributes. And there were 2 items of sharing self-perception, and 1 item of creating a good atmosphere located in reserving zone IV, and 3 (100.0%) items were both attractive attributes, as shown in Fig. 1.

5 | Discussion

5.1 | Maintain and perfect must-be and one-dimensional attributes of spiritual care needs

The results of this study showed that there were 2 must-be attributes (16.7%) among 357 hospitalized patients with breast cancer, of which, one was required to share self-perception and the other was required to create a good atmosphere. The importance (DSI) of each entry was greater than satisfaction (SI), which were both located in improving zone II. And 5 items (41.7%) were one-dimensional attributes, there were 2 items of sharing self-perception, 2 items of helping thinking, and 1 item of exploring spiritual beliefs, where the DSI and SI of the 3 items were both greater than 0.5, and were mainly located in predominance zone I and improving zone II. This indicated that must-be and one-dimensional attributes of spiritual care needs among breast cancer inpatients were mainly concentrated on sharing self-perception, create a good atmosphere, and helping thinking dimensions. They were eager to share their life feelings at the end of their lives and explore the spiritual care needs such as death and love through communication. However, due to the relatively closed hospital environment, their contact with the outside world, family members and friends was blocked due to illness, and

they can only hope that nurses would provide the conditions to help them resort to the "gods", pour out their concerns to seek spiritual peace, share their own life significance, values, goals and beliefs, review their own life experience and stories, get an understanding of life, strengthen the positive events, and affirm their own value [46]. At the same time, it is hoped that nurses will provide them with a quiet and alone environment so that they can understand the faith, death, life significance, and experience the inner peace of themselves, which is similar to the results of Ayik et al. [47]. Must-be attribute of spiritual care need, as a need that has a large impact on patients' importance but a small impact on satisfaction, is the most basic attribute need of patients and should be met first. And one-dimensional attribute of spiritual care need, as a need with great influence on patients' importance and satisfaction, is the key factor to improve the satisfaction of spiritual care in hospitals. It is suggested that hospital managers should pay attention to the satisfaction of attributes needs of sharing self-perception, creating a good atmosphere, and helping thinking, maintain and perfect their must-be and one-dimensional attributes of needs. When providing spiritual care, nurses priority should be given to ensuring the satisfaction of must-be and one-dimensional attributes of needs of patients. Nurses should play a good listening role, be good at using the art of speech to communicate with patients, provide them with a quiet and alone environment, and listen to their spiritual concerns, life stories and experiences, so that they can have a good rest and relaxation.

5.2 | Develop and innovate attractive attributes of spiritual care needs

The results of this study showed that there were 3 attractive attributes (25.0%) among 357 hospitalized patients with breast cancer, of which, two was required to share self-perception and the other was required to create a good atmosphere. The SI of each entry was greater than DSI, and SI were both greater than 0.8, which were both located in reserving zone IV. This showed that attractive attributes of spiritual care needs among breast cancer inpatients were mainly concentrated on sharing self-perception and creating a good atmosphere dimensions. Due to the long cycle of treatment and prognosis of breast cancer, most patients will produce negative emotions such as anxiety, depression, and fear, and often fall into the vicious circle of self-doubt and self-denial. It is urgent to establish self-mental strength to deal with the dilemma in front of them [8]. In the process, the nurses are expected to give themselves some humor and happiness, come into contact with positive things and other encouragement, forget the pain, and guide themselves to positively face the difficulties and problems, weaken the negative emotions on the negative impact on themselves, restore a calm state of mind, wake up their own consciousness of the subject, and then regain the sense of control over life and confidence in disease treatment, which is similar to the results of Li et al. [48]. Attributive attribute of spiritual care need, as a need that has small impact on patients' importance but great impact on their satisfaction, is an attribute need that surprises patients. If it can be fully met, it will greatly improve their satisfaction, and it is an attribute need of "something better or nothing". Its corresponding spiritual care service is also an advantageous service to improve the quality of hospital spiritual care. It is suggested that hospital managers concerned should attach importance to the satisfaction of inpatients with breast cancer who need to share their self-perception and create a good atmosphere, develop and innovate their attractive attributes needs. Diversified methods were adopted to improve the nurses' spiritual care competence. For example, during the treatment, some humor was brought to the patients (such as telling a joke), the patients were listened to carefully about their own spiritual strength, the conditions were actively provided to help the patients think about their dreams, the patients were helped to be in

a peaceful state of mind, and they were allowed to obtain the understanding and affirmation of the significance and value of life, so that they could relax physically and mentally.

5.3 | Objectively analyze and optimize indifference attributes of spiritual care needs

The results of this study also showed that there were 2 indifference attributes (16.7%) among 357 hospitalized patients with breast cancer, of which, one was required to helping thinking and the other was required to helping religious practice. The DSI and SI of 2 items were both less than 0.5, which were both located in improving zone III. This indicated that indifference attributes of spiritual care needs among breast cancer inpatients were mainly concentrated on helping thinking and helping religious practice dimensions, which were respectively "ask me about religious practices" and "help me, if I needed, with my religious practices". The reasons for this may be that, only 45 patients (12.6%) had religious beliefs in this study. Compared with the West, the religious atmosphere in the eastern cultural background was not so strong, and the activities to help religious practice were only applicable to patients with religious beliefs. Those without religious beliefs tended to have a sense of resistance, which was similar to the result of Zhang [49]. Indifference attributes of spiritual care needs, as a requirement with little impact on patients' importance and satisfaction, is an attribute need that does not matter in hospitals. It should be objectively analyzed and optimized according to the actual situation to better match the patients' must-be, one-dimensional, and attractive attributes needs to maximize the satisfaction of patients' spiritual care needs. It is suggested that hospital administrators should implement the spiritual care pertinently according to the individual differences of hospitalized patients with breast cancer. For patients with religious beliefs, the religion-related part of spiritual care needs should be paid attention to and implemented in combination with their religious beliefs. And for patients without religious beliefs, communication should be strengthened. And effective psychological interventions such as dignity therapy, significance therapy, and grief counseling should be adopted to improve their purpose, significance, and sense of value in life, reduce their physical and mental burden, and actively listen to the opinions and suggestions of different patients to carry out targeted optimization and transformation [50].

5.4 | Strengths and limitations

There were several limitations in this study. Firstly, the study was conducted using a convenience sampling method, and only 357 hospitalized patients with breast cancer were selected from three tertiary grade-A hospitals in China, which may mean that sample is not being representative enough and the findings are somewhat one-sided and cannot be generalized. It is suggested that include more breast cancer patients in different regions and levels in further research. Additionally, due to the differences and abstractness of "spirituality" cultures between the East and the West, there may be some deviations of results. It is recommended that assessment tools suitable for Chinese cultural background should be adopted. Last but not least, Kano model is only a qualitative analysis tool, but no quantifiable mechanism has been established. It is suggested that it should be combined with quantitative tools in the future to make the results more scientific and convincing.

6 | Conclusion

In this study, the Kano model can accurately and effectively qualitative analyze spiritual care needs attributes among inpatients with breast cancer and achieve the optimal ranking of the improvement of spiritual care

services, namely, "must-be attributes > one-dimensional attributes > attractive attributes > indifference attributes > reversing attributes ", and the must-be and one-dimensional attributes of spiritual care needs mainly focus on creating a good atmosphere and sharing self-perception dimensions, while attractive attributes of needs mainly focus on sharing self-perception and helping thinking dimensions. It is suggested that hospital managers should develop and innovate attractive attributes of needs on the basis of maintaining and perfecting must-be and one-dimensional attributes of needs, and objectively analyze and optimize indifference attributes of needs, so as to improve the quality and satisfaction of spiritual care in the hospitals.

Declarations

Acknowledgments The authors would like to thank all the persons who participated in the study, and thanks to teacher Xiqun Zhao from Tianjin University of Traditional Chinese Medicine for improving the language of the article.

Availability of data and material The material has no associated data or the data will be deposited. Data are available from the corresponding author on reasonable request.

Author contributions All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by Zhangyi Wang, Haomei Zhao, Yue Zhu, and Jingjing Piao. The first draft of the manuscript was written by Zhangyi Wang and Haomei Zhao, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding This study was supported by the Tianjin Research Innovation Project for Postgraduate Students (CN) [grant numbers 2021YJSS171], and the Tianjin University of Traditional Chinese Medicine Research Innovation Project for Postgraduate Students (CN) [grant numbers YJSKC-20212005].

Ethics approval This is an observational and descriptive study. The Research Ethics Committee of Tianjin University of Traditional Chinese Medicine has confirmed that no ethical approval is required.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Consent for publication The authors affirm that human research participants provided informed consent for publication.

Conflict of interest The authors declare no competing interests.

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Figures

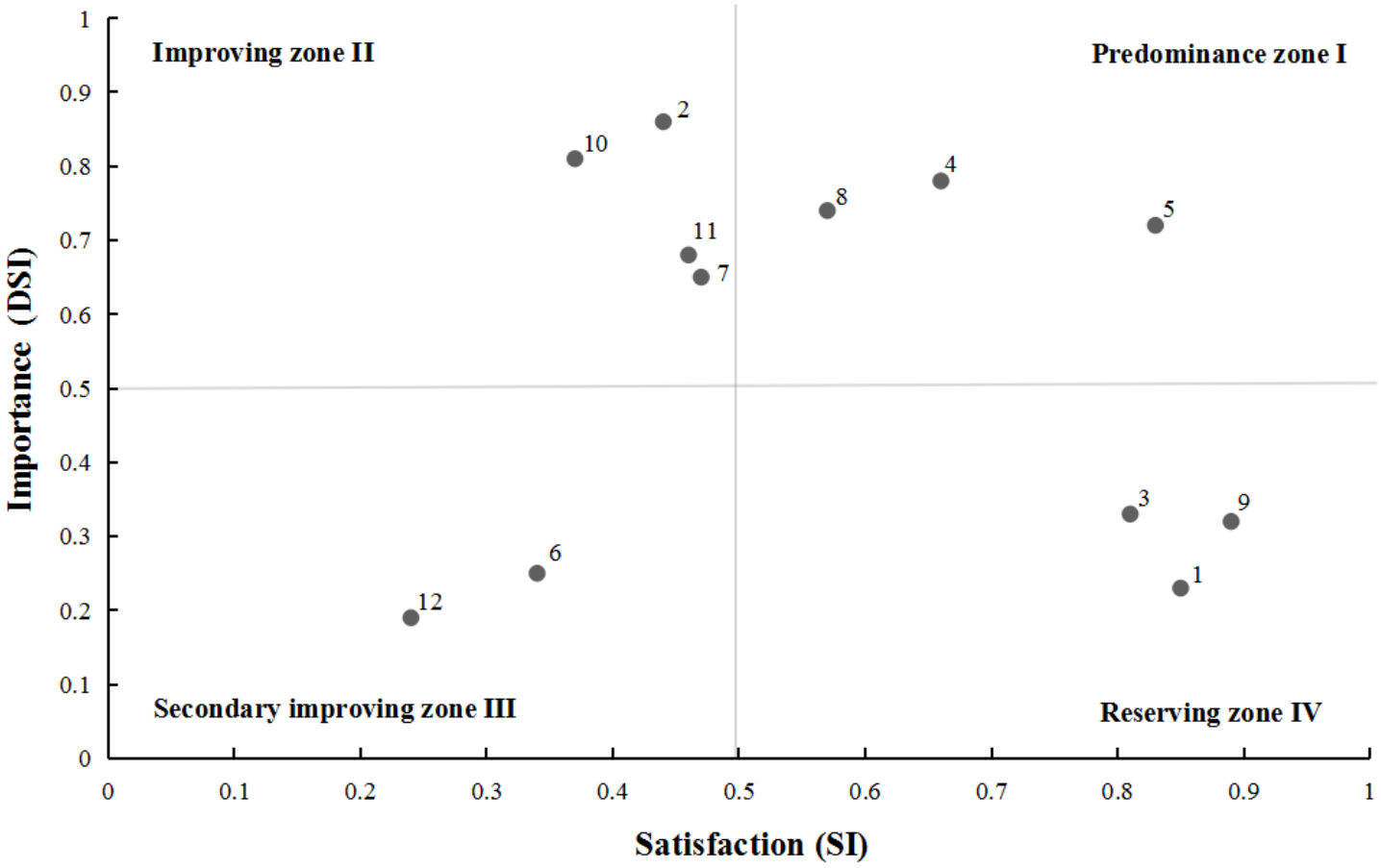

Figure 1

Legend not included with this version.

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