Factors related to preoperative uncertainty among patients with breast cancer in Wenzhou, China: A cross-sectional study

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Abstract

Background: One of the most prevalent psychological signs of breast cancer is uncertainty, which is more prevalent in Chinese patients during the preoperative period. Despite the numerous factors contributing to preoperative uncertainty, there is limited relevant research conducted in China.

Objective: This study aimed to describe the current state of preoperative uncertainty and to investigate the relationship between anxiety, illness perception, social support, and preoperative uncertainty in patients with breast cancer in Wenzhou, China.

Methods: This cross-sectional research used a simple random sampling technique to select 122 participants from a university hospital in Wenzhou, China, from July 2022 to December 2022, employing validated instruments. Descriptive statistics and Pearson's correlation coefficient were utilized to analyze the data.

Results: The average preoperative uncertainty scores of the patients fell within a moderate range (M = 61.92, SD = 7.51). Significant correlations were found between anxiety ($r = 0.638$, $p <0.01$), illness perception ($r = 0.704$, $p <0.01$), social support ($r = -0.481$, $p <0.01$), and preoperative uncertainty.

Conclusions: The results can assist healthcare professionals, especially nurses, in recognizing the factors contributing to uncertainty before surgery in patients with breast cancer. This knowledge enables them to promptly address and minimize this issue, leading to improved outcomes.

Background

Globally, breast cancer accounts for one-fourth of all cancer diagnoses in women, making it the most frequent (Sung et al., 2021). Breast cancer has the most significant incidence and fatality rates of any known tumor, ranking second in terms of cancer death among Chinese women globally (Global Cancer Observatory, 2022). Almost 11% of breast cancer cases worldwide are found in China, where the incidence has risen rapidly in recent years (Lee et al., 2016).

Surgery is often used to treat breast cancer (Scott, 2022) and is frequently carried out on individuals with stage 0, I, or II diagnoses (Winstead, 2021). Cancer diagnosis and surgery are considered threatening and traumatic events, and patients with breast cancer primarily experience stress and uncertainty while waiting for surgery, including uncertainty about the future, surgical complications, and losing the breast (Ahn et al., 2022; Sharma & Gharti, 2019; Youn & Lee, 2018). Anxiety, despair, and tension are prominent preoperative psychological symptoms among Chinese patients with breast cancer (Leonhart et al., 2017). Chinese women have a major role in the household, so patients with breast cancer usually face uncertainties, which are particularly noticeable in several emotional symptoms before surgery (Lien et al., 2009; Youn &

Lee, 2018). Previous studies have reported high overall levels of preoperative uncertainty during treatment (Kim et al., 2012).

In accordance with Mishel's uncertainty in illness theory (UIT), uncertainty is the capacity to assess the importance of actions associated with a circumstance. Patients are unable to evaluate situations mainly because they fail to assign definite values to occurrences or their inability to forecast outcomes correctly due to a lack of appropriate clues (Mishel, 1990). Uncertainty may take four different forms: (a) ambiguity about the sickness's condition; (b) complexity of the treatment and care system; (c) a lack of knowledge regarding the diagnosis and severity; and (d) unpredictability regarding the disease's progress and prognosis (Mishel, 1988).

Uncertainty negatively affects patients' quality of life (Ahadzadeh & Sharif, 2018; Guan et al., 2020) and interferes with patients' ability to seek information about their illnesses (Moreland & Santacroce, 2018). In addition, uncertainty prior to surgery had a detrimental effect on postoperative well-being, bodily signs, and emotional state, preventing patients from returning to work and slowing their recovery (Kagan & Bar-Tal, 2008).

Preoperative uncertainty was associated with various factors. Nearly 50% of patients with known preoperative symptoms have moderate to high anxiety levels (Katsohiraki

et al., 2020; Sharma & Gharti, 2019). An extended feeling of apprehension caused by an unknown or unpredictable threat is known as anxiety (Knight & Depue, 2019), characterized by constricted feelings, unsettling thoughts, and physiological changes like raised blood pressure (American Psychological Association, n.d.). Uncertainty has shown a positive correlation with the symptoms of preoperative anxiety (Ismail et al., 2010; Lien et al., 2009; Youn & Lee, 2018). Inconsistent perceptions of events and unfamiliarity with symptoms might cause ambiguity, according to Mishel (1988), who also emphasized that emotion significantly impacts symptom detection accuracy.

The psychological problems caused by breast surgery influence the patient's perception of the illness (Leonhart et al., 2017). A person's assessment and personal understanding of a health condition and its potential effects are referred to as their illness perception, which could include both favorable and adverse illness beliefs that can affect how well they are able to cope with their illness and whether they see it as manageable or dangerous (Broadbent et al., 2006). In addition, it is impacted by things like the anticipated duration of the sickness, uncertainties over the identification, the origin of the illness, and feelings like dread or worry (Broadbent et al., 2006). Also, the lack of adequate knowledge about the disease, the inability to predict its progression and prognosis, and the inability to properly face and deal with emotional reactions may lead to negative perceptions of the illness (Liu et al., 2019), and increasing uncertainty about the disease (Chen et al., 2018).

Evidence shows that degrees of uncertainty are greatly affected by social support (Lee & Park, 2020; Mishel, 1988; Zhang et al., 2018). Giving assistance or consolation to others, typically to ease their burdens from social, psychological, and physical difficulties, is referred to as social support (National Cancer Institute, 2022). Family members, friends, neighbors, caretakers, etc., may offer support to the individual. It can provide emotional support and material assistance (such as performing tasks, donating money, etc.) to make the person feel valued, welcomed, and comprehended (Xie et al., 2022). In addition, the condition can become more familiar and acknowledged with the help of appropriate education and informative support, which will reduce uncertainty (Mishel, 1988; Zhang et al., 2018). It is found that most patients' feelings of uncertainty, worry, and anxiety before surgery typically arise from unmet expectations of relevant information (Carr et al., 2017).

Inadequate nursing care has become common, mainly due to high inpatient turnover, intense workloads, and a lack of adequate staffing, with communication and education being the most overlooked aspects (Blackman et al., 2015; Hernández-Cruz et al., 2017), especially during the COVID-19 pandemic (Safdari et al., 2023). One crucial reason contributing to patients' high degree of uncertainty approaching surgery is their lack of interaction with healthcare providers (HCPs) (Cheng et al., 2021) who, as providers of structure in the UIT (Mishel, 1988), are also major source of informative and emotional support for preoperative patients (Cheng et al., 2021). Furthermore, during the short and limited preoperative period, caregivers provide consistent, routine, standardized information about hospital procedures and surgical preparation while neglecting patients' psychological

aspects and individual needs (Mitchell, 2017). Therefore, a thorough preoperative assessment is essential, and a better description of the patient's preoperative psychological state as well as the influencing factors, is desired to inform the development of nursing interventions.

Although several studies have confirmed a relationship between many factors and uncertainty, little focus has been placed on the preoperative phase in China. Notably, the UIT indicates that social support can directly reduce uncertainty; however, discussions regarding this factor have never been more relevant, particularly because of the COVID-19 pandemic, when social interactions in closed settings were challenging. In summary, the lack of information and support can, in turn, directly contribute to patient anxiety and the generation of negative perceptions of the illness.

Furthermore, given that Chinese women are vital members of the family who raise children, they frequently have psychological side effects from breast cancer (Leonhart et al., 2017). Therefore, guided by UIT (Mishel, 1988), anxiety, illness perception, and social support were chosen in this study as the three critical factors of uncertainty. This study aimed to identify the relation between these factors and preoperative uncertainty as well as to characterize the current state of preoperative uncertainty among patients with breast cancer in Wenzhou, China.

Methods

Study Design
A cross-sectional research design was employed in this study.

Samples/Participants
Using a simple random sampling method, 122 patients with breast cancer that were hospitalized in the breast cancer unit of one hospital in Wenzhou were enrolled. They had never undergone breast cancer surgery or treatment before receiving their initial breast cancer diagnosis. The requirements for inclusion in the sample were as follows: 1) hospital stay for observation at least 24 hours prior to surgery; 2) aged ≥18 years and ≤60 years; 3) can read, write, speak, and understand Mandarin; 4) have a good orientation to place and time; and 5) no history of mental illness from the medical records.

Power Analysis and Sample Size (PASS) version 15.0 was used to determine the sample size. To test whether this index was significantly higher than the moderate correlation coefficient of 0.4 (Akoglu, 2018), the alpha was set to .05 and the power to 0.80 (Bujang & Baharum, 2017), which calculated a sample size of 111 cases. Considering a 10% data inefficiency, at least 122 patients should be included.

Instruments
Five instruments were used. All instruments, except for the demographic questionnaire, were used with permission from the original authors.

1) The demographic questionnaire was developed by the researchers. Participants self-reported general information, including age, educational level, marital status, income level, and working status. In addition, health-related data was gathered from medical records containing the duration of

diagnosis, type of surgery to be performed, cancer stage, and history of other diseases and surgeries.

2) The Chinese version of Mishel's Uncertainty in Illness Scale (C-MUIS) was utilized to measure uncertainty (Ye et al., 2018), which contains three domains with 20 items: Ambiguity, Uncertainty, and Unpredictability. These questions were rated on a 5-point Likert scale with 1 (strongly disagree) to 5 (strongly agree), and the final scores were summed from 20 to 100. An increase in the score represents the more uncertain the situation is. There are three distinct degrees of uncertainty: low (20–46.6), moderate (46.7–73.3), and high (73.3–100). The Cronbach's alpha for this study was 0.88, whereas the range for each dimension was from 0.81 to 0.86 and 0.83 for the overall scale, according to Ye et al. (2018).

3) The Chinese version of the Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety; the MAPI Research Trust (MRT) approved and contributed the Chinese translation (Zigmond & Snaith, 1983). The scale can be accessed at https://eprovide.mapi-trust.org/instruments/hospital-anxiety-and-depression-scale. It comprised 14 items and seven items for anxiety and depression. Items were scored on a 4-point Likert scale from 0 (no symptoms) to 3 (frequent presence of signs). For each subscale, the maximum score was 21. Just the anxiety scale was applied in this study. A score of 8 to 10 indicates mild anxiety, 11 to 14 for moderate, and 15 to 21 indicates a severe level (Stern, 2014). With a Cronbach's alpha reliability score of 0.87 in this sample and 0.83 in the prior study (Bjelland et al., 2002), the scale maintained satisfactory internal consistency.

4) The Chinese version of the Brief Illness Perception Questionnaire (B-IPQ) was adopted to measure the perception of illness, is available at https://www.wjx.cn/xz/152046295.aspx and can be used publicly and for free in China. This version includes nine items, and no items were modified, covering three aspects (Broadbent et al., 2006): cognitive, emotional, and illness comprehension. Items 1 through 8 are evaluated on a 10-point scale, and the sum of the points indicates how dangerously the disease is rated (Broadbent et al., 2006), representing more negative perceptions of the disease status. Question 9 was an open-ended question regarding the patient's top-ranked causes of their illness. It takes approximately 5 minutes to finish the whole scale. It kept its excellent structural reliability at 0.73 (Mei et al., 2015), while Cronbach's alpha was 0.84.

5) The Chinese version of the Multidimensional Scale of Perceived Social Support (MSPSS) was adopted to assess perceived support, which was provided and permitted to be used by Dr. Sara G. Zimet without any changes to the original scale's content (Zimet et al., 1988). This 12-item measure evaluates support from families, friends, and significant others, with higher total scores suggesting improved social support (Zimet et al., 1988). The reliability of the overall scale was 0.92 (Guan et al., 2015), and it was 0.89 for this study.

Data Collection
With assistance from the head nurse and the ward nurses, the researchers selected 5–6 participants per day using a simple random sampling technique from July 2022 to December 2022. After confirming the time of the patient's surgery, the researchers explained the purpose and methods of the study, and the participants who met the inclusion criteria signed an informed consent form. The participants completed the questionnaire by themselves, accompanied by the researchers, 24 hours prior to the time of the surgery. All patients participated in the study voluntarily. Those who had difficulty completing the questionnaire received assistance from the researchers, who read the contents aloud and filled out the questionnaire after receiving their responses. The time taken to fill out the questionnaire was 30 mins.

Data Analysis
Statistical Package for the Social Science (SPSS) version 13.0 served as the tool for the analysis of data. Before being processed, the accuracy and completeness of all data were verified. There was no missing data. The interpretation of the demographic variables was made with descriptive statistics. The relationships between the variables were examined using the Pearson correlation coefficient. All assumptions for Pearson's correlation were satisfied.

Ethical Considerations
Approvals were obtained from the Research Ethics Committee of Burapha University (Protocol code G-HS017/2565) and the hospital (Approval No. 2022-K-75-02). The objectives, methods, and time needed to complete the questionnaires were all explained to the participants by the researchers. Until data collection was finished without having an adverse effect on their treatment, participants were free to decide whether to participate and to continue, refuse, or discontinue at any time. A consent form was signed after the consent to participate. Permission to use these tools was granted by the original authors before data collection. All Chinese versions were available directly through the authors; no translation work was performed for this study.

Results

Description of Participant Characteristics
Table 1 reveals that the 122 participants' ages ranged from 28 to 60 years (Mean = 48.2, SD = 8.43). They were all female, graduated from middle or high school (47.5%), got married (91%), had a low average monthly income of less than ￥5,000 (55%), and currently have a job (73.8%). The participants had a very short time between receiving a diagnosis and being admitted to the hospital for surgery, ranging from 1–7 days (M = 3.5, SD = 1.4). They were diagnosed with stage II (63.9%) with stage I, had a planned mastectomy (98.4%), had no comorbidities (73.8%), and had no experiences of any surgery before (89.3%).

Description of Preoperative Uncertainty
Table 2 shows that the participants had a moderate uncertainty level (M = 61.92, SD = 7.51). The mean scores of the three dimensions of uncertainty were 23.92 of 40 for ambiguity (SD = 2.95), 19.02 of 35 for lack of clarity (SD = 3.37), and 18.98 of 25 for unpredictability (SD = 2.24). Seen from Table 3, 91% had moderate uncertainty, 6.5% had high uncertainty, and only 2.5% had low uncertainty.

Table 4 illustrates that participants had a mean anxiety score at a mild level (M = 9.36, SD = 3.24). The average score for illness perception was 48.04 (SD = 8.57) and 65.28 for social support (SD = 6.31).

Table 1 Demographic characteristics of the participants (*N* = 122)

Characteristics	f	%	M (SD), min-max
Age (Years)			M = 48.2 (SD = 8.43),
18–30	2	1.6	min = 28, max = 60
31–40	26	21.3	
41–50	46	37.7	
51–60	48	39.4	
Highest Level of Education			
Below primary	22	18.0	
Middle or high school	58	47.5	
Bachelor's degrees and above	42	34.5	
Marital Status			
Single	11	9.0	
Married	111	91.0	
Monthly Income (1 CNY = 0.14 USD)			
Less than ¥ 3,000	23	18.9	
¥ 3,000–5,000	44	36.1	
¥ 5,000–10,000	38	31.1	
More than ¥ 10,000	17	13.9	
Working Status			
Employed	90	73.8	
Unemployed	23	18.9	
Retirees	9	7.3	
Time from Diagnosis to Hospital Admission for Surgery (Days)			M = 3.5 (SD = 1.4),
1	3	2.4	min = 1, max = 7
2	30	24.6	
3	42	34.4	
4	12	9.9	
5	23	18.9	
6	9	7.4	
7	3	2.4	
Type of Surgery			
Mastectomy	120	98.4	
Lumpectomy	2	1.6	
Cancer Stage			
Stage I	44	36.1	
Stage II	78	63.9	
Comorbidity			
No	90	73.8	
Yes	32	26.2	
Have Any Operations Before			
No	109	89.3	
Yes	13	10.7	

Table 2 Preoperative uncertainty and its dimensions (*N* = 122)

Preoperative Uncertainty	Possible Score	Actual Score	M (SD)	Level
Total	0–100	46–76	61.92 (7.51)	Moderate
Ambiguity	0–40	16–30	23.92 (2.95)	
Lack of clarity	0–35	12–25	19.02 (3.37)	
Unpredictability	0–25	15–24	18.98 (2.24)	

Table 3 Levels of uncertainty (*N* = 122)

Uncertainty Level	Possible Score	Actual Score	M (SD)	*n*	%
Low	20–46.6	46	46.00 (0.00)	3	2.5
Moderate	46.7–73.3	47–71	61.42 (6.54)	111	91.0
High	73.3–100	74–76	74.88 (0.64)	8	6.5

Relationships between anxiety, illness perception, and social support and uncertainty

Table 5 illustrates a strong positive relationship between anxiety and uncertainty (*r* = 0.638, *p* <0.01), and the same relationship was found between illness perception and uncertainty (*r* = 0.704, *p* <0.01). A moderate negative relationship was identified between overall social support and uncertainty (*r* = -0.481, *p* <0.01).

Table 4 Description of the variables and subscales (*N* = 122)

Variables	Possible Score	Actual Score	M (SD)	Level
Anxiety	0–21	2–17	9.36 (3.24)	Mild
Illness Perception	0–80	26–65	48.04 (8.57)	–
Social Support	0–84	51–78	65.28 (6.31)	–
Family support	0–28	19–28	25.18 (2.05)	
Friends support	0–28	14–25	19.45 (2.69)	
Support from significant others	0–28	14–28	20.64 (2.96)	

Table 5 Preoperative uncertainty and its related factors (*N* = 122)

Independent Variables	Preoperative Uncertainty
Anxiety	0.638**
Illness perception	0.704**
Social support	-0.481**

** *p* <0.01

Discussion

Preoperative Uncertainty among Patients with Breast Cancer

Preoperative uncertainty among patients with breast cancer in this study was moderate, as reported in this study, and ambiguity had the highest mean score in all dimensions. This outcome matches previous research from China (Chen et al., 2022; Lien et al., 2009; Wei et al., 2019). Furthermore, it is verified that the majority of patients with breast cancer have moderate to high uncertainty at initial diagnosis, early therapy, and prior to surgery (Chen et al., 2022; Inan et al., 2016).

The moderate preoperative uncertainty in this study may be closely linked to the short turnaround from diagnosis to hospital admission, which occurred all within one week, with a mean of 3.5 (SD = 1.4) days. A study showed that the waiting time from diagnosis to surgery for patients with breast cancer ranged from 1 to 3 weeks (Drageset et al., 2011); however, several studies provide evidence of a mean waiting time of 30 (range, 8–78) days (Hawrot et al., 2021; Lee et al., 2016). In Wenzhou, China, the time from admission to surgery is usually very short for patients in the breast surgery department; the average hospital stay was 5.25 days (1.01 days before surgery and 4.14 days after surgery) in Wenzhou city. This may result in patients not having enough time to get thorough information about the procedure and their disease. As a result, patients waiting for surgery are unable to learn more about their cancer and the treatment before surgery, making them feel uncertain about the future because they believe that the disease cannot be planned for (Chen et al., 2022).

In the preoperative phase, many patients experience a shift from a healthy position to a diseased state, during which they believe that they have no control over the situation and that the disease becomes unpredictable (Boehmke & Dickerson, 2006). Some patients fear pain and postoperative nausea, whereas others fear surgical scars and dependence on others for practical help after surgery (Drageset et al., 2011). Additionally, during the COVID-19 pandemic, uncertainty occurred because of the instability of the epidemic and changes in hospital policies (Cohen et al., 2022). In China, women with breast cancer experience more preoperative uncertainty because Chinese patients are reluctant to ask questions, and some participants are ashamed to ask for help (Zhang et al., 2018), resulting in their inability to communicate with their doctors promptly to obtain the disease information (Ismail et al., 2010). Patient's preoperative uncertainty may increase with age, which may be related to declining physical functions (Wei et al., 2019), and women over 50 with stable jobs and families were more concerned about how treatment would affect their physical health and parental responsibilities (Liao et al., 2008). Furthermore, patients with low education levels generally have poor knowledge about treatment and disease prognosis (Wei et al., 2019). For patients with low incomes, the potential financial burden of surgery on the family can create a strong sense of uncertainty (Wei et al., 2019).

Factors Related to Preoperative Uncertainty

This study identified mild anxiety, and a positive correlation between anxiety and preoperative uncertainty was revealed. Although previous studies stated that patients with breast cancer always experience a moderate or high anxiety level before surgery (Katsohiraki et al., 2020; Kim et al., 2020), which peaks 1–2 days before surgery (Lien et al., 2009). Nevertheless, patients had less anxiety in this study, perhaps because they had undergone a breast biopsy before surgery and were aware of their breast tumors (Liao et al., 2008). Another reason is the short time between the diagnosis and admission of the participants in this study. Although previous studies have confirmed that such a short time may result in patients not gaining more knowledge about the disease and possibly having more uncertainty or other emotional problems (Chen et al., 2022; Drageset et al., 2011), many of them want to complete the surgery and move on with their lives as soon as possible (Drageset et al., 2011). Therefore, reducing the length of admission or waiting time for surgery may reduce anxiety before the surgery. Anxiety, as a negative emotion, can directly cause patients to develop false perceptions of the disease and interfere with their ability to find disease-related information (Liao et al., 2008), which causes the actual illness or symptom to be interpreted as more serious, thereby stimulating a sense of uncertainty (Mishel, 1988; Szulczewski et al., 2017). Moreover, throughout the COVID-19 pandemic, uncertainty was more highly correlated with anxiety and other feelings and actions (Supriati et al., 2022). Patients are more vulnerable to treatment and anxiety related to infection because of the changes in hospital policies, limited care availability, and reduced interactions (Vanni et al., 2020).

In this study, the mean preoperative illness perception score was moderate. In addition, our results showed moderate negative associations between overall social support and preoperative uncertainty. Studies have demonstrated that patients in the early stages of treatment have a more negative perspective on the disease (Osmialowska et al., 2022). A study in China noted a prevalence of moderate to high negative illness perceptions in cancer patients preoperatively (Wang et al., 2021), who perceived the disease as more severe, longer lasting, and uncontrollable (Shabrina & Iskandarsyah, 2018). If people perceive a pattern of events contrary to what is expected, the ability to adequately assess the situation and select appropriate actions will be limited (Mishel, 1983). Moreover, this study's results may be related to factors such as sex, age, education level, and surgical modality. Studies have shown that young women appear to have a higher perceived illness threat than men (Park et al., 2021; Shahnawaz et al., 2022) and that patients with higher education perceive that the condition has a shorter duration, fewer negative consequences and emotional effects, and better treatment control because they have additional disease knowledge (Kaptein et al., 2015; Karabulutlu et al., 2019; Mishel, 1983). Patients who underwent mastectomy perceived a longer duration of therapy and a more severe outcome (Zhang et al., 2016). Also, it is believed that the illness perception of patients with breast cancer is one of the major causes of negative emotions (Park et al., 2021) and has a positive correlation with symptom severity (Shahnawaz et al., 2022). This suggests that negative illness perceptions are associated with perceptions that symptoms are more severe, harder to control, and more threatening. In addition, there is evidence that physical and psychological results are related to perceived illness danger (Man et al., 2020). According to Mishel's theory, familiarity with and understanding symptom

patterns and events can reduce feelings of uncertainty about illness (Mishel, 1988).

Another factor related to preoperative uncertainty is social support, and the mean of the total social support scores in this study was high. The highest social support was that received from the family, which is consistent with other studies in which patients received preoperatively high levels of social support, mainly through the company and encouragement of their husbands and children (Drageset et al., 2011; Sharma & Gharti, 2019). The high level of preoperative social support may be due to the special policy of the pandemic and marital status. According to hospital policy, patients can only have one family member as a regular companion, and no one else has free access. This reduces the number of companions but gives the patient a stable companion. Although patients' interactions with close friends and relatives decreased during this time, they still gained more frequent contact through extensive use of social software (Cohen et al., 2022). Also, the findings demonstrated a moderately negative association between social support and preoperative uncertainty in patients with breast cancer, which was represented by additional research (Lee & Park, 2020). The patients were accompanied by their roommates and other patients in the unit, in addition to their regular companions, as they were not permitted to enter or leave the department at will during the COVID-19 pandemic. Social support from people who have had similar experiences is believed to reduce uncertainty by assisting patients in understanding symptom patterns and becoming familiar with the events that happen to them (Mishel, 1988). However, patients with breast cancer with strong social support can be protected from the adverse effects of stressful situations (Salakari et al., 2017) and overcome psychological barriers (Lee & Park, 2020). After a series of medical treatments and education to increase disease awareness, patients showed predischarge uncertainty levels lower than their preoperative uncertainty levels (Wei et al., 2019), demonstrating the value of education and informational support in alleviating preoperative uncertainty.

Limitations
We were unable to draw a causal conclusion between results and factors because this study was cross-sectional. In addition, the findings from this research did not reflect the general situation of patients with breast cancer in this area because it was only conducted in one hospital in Wenzhou City.

Implications and Recommendations
The current state of preoperative uncertainty among patients with breast cancer in Wenzhou is discussed in this study in the context of Chinese demographic and cultural traits and their relation to these factors. The value of this study is that it closes a research gap in the preoperative period in China, where the majority of the literature has concentrated on survival and the postoperative phase. All participants have a very short wait time from admission to surgery, emphasizing how crucial it is to maximize patient interaction in a constrained amount of time. In order to lessen patients' anxiety and uncertainty before surgery, healthcare providers, especially nurses, must make sure that patients have access to accurate and trustworthy information about their condition, available treatments, and

possible outcomes. Patients can benefit from healthcare providers' comprehensive care and support to manage the psychological strain of the surgery and reinforce a positive perspective on their illness, leading to better outcomes and higher satisfaction with the healthcare system. Further research should be conducted frequently in other regions and at various times to provide more convincing data and examine the causal relationship between these variables.

Conclusion

The study results revealed that patients with breast cancer experienced moderate levels of preoperative uncertainty, with significant associations found between preoperative uncertainty and factors such as anxiety, illness perception, and social support. Preoperative uncertainty is particularly prevalent among patients with breast cancer in China, likely influenced by cultural factors. This uncertainty can lead to various physical and psychological symptoms and negatively impact post-surgical recovery. The results of this study can help healthcare professionals, specifically nurses, in identifying the factors contributing to preoperative uncertainty in patients with breast cancer. By recognizing these factors, nurses and other healthcare providers can take timely measures to prevent and alleviate preoperative uncertainty, aiming for improved outcomes.

Authors' Contributions
All authors contributed substantially to the conception and design of the study, acquisition of data, and analysis and interpretation of data. Additionally, all authors drafted or revised the manuscript critically for important intellectual content and approved the final version.

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Data Availability
The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of Use of AI in Scientific Writing
Nothing to declare.

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