Preoperative Uncertainty and Anxiety Among Chinese Patients With Gynecologic Cancer

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Purpose/Objectives: To determine the levels of preoperative anxiety and uncertainty in Hong Kong Chinese women with gynecologic cancer, the demographic factors that may affect the intensity of anxiety, and the effects of uncertainty on the anxiety levels of these women.

Design: Cross-sectional.

Setting: The gynecologic oncology unit of a public hospital in Hong Kong.

Sample: 170 Chinese women with diagnosed (or suspected) gynecologic cancer who were scheduled for surgery and able to read Chinese.

Methods: A self-administered questionnaire consisting of the Chinese version of Mishel's Uncertainty in Illness Scale (MUIS-C), the State-Trait Anxiety Inventory, the Medical Outcomes Study Social Support Survey, and demographic data.

Main Research Variables: Gynecologic cancer, anxiety, and uncertainty.

Findings: The mean scores of state anxiety and on the MUIS-C were 48.3 (SD = 11.58) and 92.27 (SD = 13.49), respectively. A higher level of anxiety was significantly associated with inadequate social support ($r = -0.189$, $p = 0.014$) and a higher level of uncertainty ($r = 0.405$, $p < 0.001$).

Conclusions: Women perceiving a higher level of uncertainty are more likely to report a higher level of anxiety, although adequate social support may reduce this.

Implications for Nursing: Nurses should increase their awareness of the adverse effects of uncertainty on their patients' mental health. They can help to relieve anxiety by minimizing uncertainty levels of their patients through offering emotional support and providing information on the disease, treatment plans, and rehabilitation. Adequate social support should be provided to patients before surgery, which might help to reduce their anxiety.

Anxiety is considered to be a common emotional response in most surgical patients (Welsh, 2000). Several studies have shown that women undergoing surgery experience a higher level of anxiety than men (Caumo et al., 2001; Karanci & Dirik, 2003). The evidence also has shown that patients receiving invasive treatment have higher levels of anxiety and more emotional reaction than those receiving noninvasive treatment (Hughes, 2002). Among women receiving surgery for gynecologic cancer, anxiety may be increased by the uncertainty of the diagnosis (Sukegawa et al., 2008) and lack of information about the treatment and its side effects (Carr, Brockbank, Allen, & Strike, 2006).

Uncertainty has been shown to affect levels of anxiety among hospitalized patients (Mishel, 1997) and to constitute a major source of stress (Mishel, 1984). However, research into the impact of uncertainty and other factors on anxiety in the Chinese cancer population has been limited. The aim of this study was to examine levels of anxiety and uncertainty among Hong Kong Chinese women prior to surgery for gynecologic cancer and to identify factors that might affect their levels of anxiety. The following research questions were investigated.

- What are the levels of anxiety and uncertainty in Hong Kong Chinese women with gynecologic cancer in need of surgery?
- What are the demographic and clinical factors that may affect the levels of anxiety in these women?
- Does an association exist between levels of uncertainty and levels of anxiety experienced by these women?

Literature Review

Gynecologic cancer refers to any cancer that starts in a woman's reproductive organs. Five main types exist: cervical, ovarian, uterine, vaginal, and vulva (Centers for Disease Control and Prevention, 2008). According to statistics of the Hong Kong Cancer Registry (n.d.), three of the five types were ranked among the 10 most common cancers in Hong Kong: corpus uteri cancer (incident rate = 4.6%), ovarian cancer (incident rate = 3.9%), and cervical cancer (incident rate = 3.6%), giving a summary incident rate of 12.1%. Such figures have drawn the attention of healthcare professionals and society in general toward women's health and the necessity of quality care and support for this particular population.

The primary treatment for most gynecologic cancer is surgery (Dorigo & Baker, 2003). Research has shown

that preoperative anxiety is reported commonly by hospitalized patients (Karanci & Dirik, 2003; Mitchell, 2003). According to Walker (1990), anxiety is defined as a subject's unpleasant experience associated with the perception of real or imagined threat. Spielberger (1983) further categorized anxiety into state anxiety and trait anxiety. State anxiety is conceptualized as a transitory emotional state in humans that varies in the face of danger. Trait anxiety refers to an individual's general response to state anxiety in the anticipation of threatening situations. Prolonged anxiety may increase levels of postoperative pain, delay recovery, and affect quality of life (Carr at al., 2006; Munafo & Stevenson, 2001; Sammarco, 2001). These definitions were the conceptual foundation for this study, which measured the emotional states of patients during surgery for gynecologic cancer.

Previous studies have reported that patients with newly diagnosed cancer who are waiting for surgery experience anxiety (Carr et al., 2006; Sukegawa et al., 2008; Visser et al., 2006). In fact, several studies have indicated that women experience distress when undergoing gynecologic surgery. Carr et al. examined the patterns and frequency of anxiety in women undergoing surgery using a mixed-method research design. They found that almost half of the sample experienced high levels of preoperative anxiety. Sukegawa et al. investigated anxiety and prevalence of psychiatric disorders among 27 patients awaiting surgery for suspected ovarian cancer. They found that the mean state anxiety score of the patients was higher than that of the general population, and 33.3% qualified as having an adjustment disorder. The high level of anxiety among patients with cancer undergoing surgery seriously impaired their quality of life when compared with the general population (Visser et al.).

Uncertainty is a common response among patients undergoing surgery. According to Mishel and Braden (1988), uncertainty is defined as inability to decide the meaning of illness-related events or to predict outcomes accurately. Previous studies have examined the association between uncertainties and anxieties in cancer populations (Carr et al., 2006; Twinn, 2006). In research to examine the patterns and frequency of anxiety in women undergoing gynecologic surgery, Carr et al. interviewed 44 women and found that most of the events that influenced anxiety were related to inadequate information. Twinn examined the responses of Hong Kong Chinese women with abnormal Pap smear results and compared differences in the responses of the women. She found that women who were unclear about the reason for the abnormal result were more likely to suffer from feelings of fear and uncertainty than those who understood its cause. However, both studies used a qualitative approach. Further investigation of the relationship between uncertainty and anxiety in the Chinese population is essential to identify the particular psychological needs of women undergoing surgery for gynecologic cancer.

Studies examining factors that affect levels of anxiety among preoperative patients with cancer are limited. Deane and Degner (1998) conducted a study in Canada on information needs, uncertainty, and anxiety in women who had benign outcomes from breast biopsy. They showed that uncertainty and anxiety levels were heightened when they underwent breast biopsy and that receipt of information might affect uncertainty and anxiety. Sukegawa et al. (2008) examined anxiety and prevalence of psychiatric disorders among 27 patients awaiting surgery for suspected ovarian cancer. They found that the three most common reasons for anxiety prior to surgery were the possibility of cancer, the possible complications of surgery, and changes in the patient's life after surgery. To date, no research has examined preoperative uncertainty and anxiety in the general Chinese population with gynecologic cancer and the factors that affect levels of anxiety. People from different cultural backgrounds may have different psychological needs; therefore, a better understanding of the relationship between uncertainty and anxiety among women with gynecologic cancer in the Chinese population is crucial so that appropriate interventions can be designed and implemented effectively to reduce patients' anxiety levels.

Conceptual Framework

This study was guided by Mishel's Uncertainty in Illness Theory (1981) to examine the preoperative uncertainty and anxiety of patients with gynecologic cancer in Hong Kong. Mishel (1981) defined uncertainty as the inability to determine the meaning of illness-related events. According to Mishel (1981), uncertainty consists of four main elements: ambiguity about the illness, complexity of treatment and the healthcare system, lack of information or inconsistent information about the illness, and the unpredictability of the illness and its prognosis. When uncertainty is aroused about a possible danger, the psychological status of an individual may be threatened.

Mishel's theory structured this examination and analysis of uncertainty and preoperative anxiety through the proposition that uncertainty has an adverse effect on psychological well-being. Early identification of types of uncertainty would help patients to use effective coping strategies to reduce uncertainty and maintain their individual psychological well-being. Thus, the Uncertainty in Illness Theory can guide the study of such uncertainty and whether uncertainty and other factors affect the level of preoperative anxiety in Hong Kong Chinese women with gynecologic cancer.

Methods

Design and Sample

This study used a cross-sectional design. It was conducted in the gynecologic oncology unit of a regional tertiary teaching hospital in the Hong Kong Special Administrative Region. Potential participants were recruited from July 2005–May 2006. Eligibility criteria included patients aged 18 years or older with diagnosed (or suspected) gynecologic cancer who were scheduled for surgery and who were able to read and understand Chinese. Patients with a history of emotional problems or mental impairment were excluded. A total of 196 subjects were eligible to participate during the relevant period. Among them, 20 refused to participate because they were afraid that filling in the questionnaire would induce more anxiety, and 6 more dropped out for unknown reasons. In total, 170 patients participated in the study and completed the questionnaire the day before surgery, a response rate of 86.7%.

Procedures

The institutional review board of the hospital approved this study before data collection started. Potential participants were approached one day before the scheduled operation by the researcher, who provided a detailed explanation of the study's purposes and procedures. Sufficient time was allowed for patients to read through the information sheet, and an opportunity to ask questions about the study was provided. Those who were interested in participating were asked to sign a consent form, fill in the questionnaire, and return the form and questionnaire to the researcher, who scanned them on the spot and clarified unclear responses.

Study Measures

The self-report survey questionnaire consisted of four parts.

Chinese version of Mishel's Uncertainty in Illness Scale (C-MUIS): This scale was used to measure the construct of uncertainty. It was developed and modified by Mishel and based on his Uncertainty in Illness Theory among a North American population (Mishel, 1981, 1997). The MUIS has been used extensively among cancer, cardiac, and chronic illness populations. Taylor-Piliae and Molassiotis (2000) translated and assessed the psychometric properties of the Chinese version of the MUIS among cardiac and chronically ill Hong Kong Chinese populations and found that the instrument was suitable for the populations under study.

The C-MUIS consists of 33 items, classified into four aspects of uncertainty: (a) ambiguity, which represents cues about the state of the illness which are vague or indistinct (13 items); (b) complexity, which represents varied cues about the treatments and systems of care (7 items); (c) inconsistency, which represents information that changes frequently or conflicts with previous information (7 items); and (d) unpredictability, which represents a lack of consistency between the illness, treatment cues, and outcome (5 items). The C-MUIS uses a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to represent perceived uncertainty. The individual subscale scores are calculated by summing all of the items in each subscale, whereas the total scores are the sum of all of the item scores except item 15 ("There are so many different types of staff, it's unclear who is responsible for what"). Higher scores indicate higher levels of uncertainty (Mishel, 1997). The Cronbach alpha coefficient (α) for the C-MUIS in the chronically ill population was acceptable when compared with Mishel's original work, except for the subscales of unpredictability ($\alpha = 0.44$) and complexity ($\alpha = 0.59$). In the current sample (N = 170), the α for the entire scale was 0.86 and for each subscale ranged from 0.543–0.863 ($\alpha_{ambiguity} = 0.863$; $\alpha_{complexity} = 0.543$; $\alpha_{inconsistency} = 0.736$; $\alpha_{unpredictability} = 0.602$).

Chinese version of the State-Trait Anxiety Inventory (C-STAI): The C-STAI is a 40-item instrument developed by Shek (1991) and based on the original version of the State-Trait Anxiety Inventory developed by Spielberger (1983). It is a self-administered instrument designed to evaluate an individual's feelings of apprehension, tension, nervousness, and worry. The C-STAI consists of two subscales labeled state anxiety (transient, situational feeling at the moment) and trait anxiety (general, ongoing feeling), each of which has 20 items. Respondents rate the degree to which the item represents a current feeling on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much). Higher scores indicate higher levels of anxiety (Shek, 1991). Because state anxiety is a transitory emotional state at a particular moment in time, this portion of the C-STAI was used for the present study to measure the level of preoperative anxiety among the participants at that moment. The α reported by Shek (1988) in a study of 2,150 Chinese secondary-school pupils was 0.9 for state anxiety. The α for state anxiety in this study was 0.92.

Medical Outcomes Study Social Support Survey–Chinese version (MOSSSS-C): The MOSSSS-C is a multidimensional instrument that assesses the functional aspects of the social support perceived by the respondents. It is a 20-item instrument developed by Sherbourne and Stewart (1991) and consists of 19 functional support items and 1 additional item. The 19 items are categorized into four subscales: (a) emotional and informational support (expression of understanding and empathy; provision of advice, information, or feedback) (8 items); (b) tangible support (provision of material aid or behavioral assistance) (4 items); (c) affectionate support (expression of love and affection) (3 items); and (d) positive social interaction (availability of other people

to do fun things with the respondent) (4 items). Each item is rated on a 5-point Likert scale to indicate how often the respondent receives the support (1 = none of the time, 2 = seldom, 3 = some of the time, 4 = most of the time, and 5 = all of the time). A higher score indicates better perceived social support. The additional item measures the number of close relatives and friends an individual has and assesses the structural dimension of social support.

Yu, Lee, and Woo (2004) studied the psychometric properties of the MOSSSS-C in Hong Kong Chinese heart-failure populations. The α for the entire scale was 0.98 and 0.93–0.96 for the subscales. For the current sample, the α of the entire MOSSSS-C was 0.96, and that of the subscales ranged from 0.82–0.92.

Demographic and clinical data: Demographic data such as age, monthly household income, educational level, and social support were obtained from the participants. Clinical data such as stage of disease, type of surgical procedure, and comorbidity were collected from the participants' medical records after informed consent had been obtained.

Statistical Analysis

Descriptive analyses were performed on all variables. T test and one-way analysis of variance were used to determine whether the levels of anxiety changed among participants who had different demographic characteristics. A Pearson correlation was used to examine the association among social support, uncertainty, and anxiety. A p level of 0.05 or less was considered statistically significant.

Results

Demographic and Clinical Characteristics

The demographic and clinical characteristics of the participants are displayed in Table 1. The mean age was 49.3 (range = 19–86). The mean chronic disease score was 1.42. More than half of the participants were married or cohabitating (59%), had middle or high household incomes per month (51%), and were not employed (51%). One-third had an education level of primary or below (32%), and 60% were without religious belief. Most of the participants were diagnosed with cancer (62%) and had been scheduled to receive major surgery (67%). However, most had had prior surgery (74%) and most of their family members or friends did not have cancer (85%). The mean MOSSSS-C total score was 71.66 (see Table 2).

Intensity of Anxiety and Uncertainty

The mean score of state anxiety was 48.30 (range = 20–74), and the mean score on the MUIS-C was 92.27 (range = 48–128). The four subscale scores for the MUIS-C were higher than the sample mean (see Table 3).

Table 1. Demographic and Clinical Characteristics of Participants

Characteristic	$\bar{X}$	SD	Range
Age (years)	49.3	13.45	19–86
Chronic disease score	1.42	1.77	0–7
Characteristic		**n**	**%**
Marital status			
Single, divorced, or widowed		70	41
Cohabitating or married		100	59
Employment status			
Employed (full-time or part-time)		83	49
Not employed (unemployed, housewife, student, or retired)		87	51
Income per month (Hong Kong $)			
Low (≤ 10,000)		83	49
Medium (10,001–30,000)		56	33
High (> 30,000)		31	18
Educational level			
≤ Primary		54	32
Secondary		78	46
>Secondary		38	22
Religious belief (including Buddhism, Catholicism, and Christianity)			
No		102	60
Yes		68	40
Type of surgery			
Minor or medium		36	21
Major		114	67
Ultra-major		20	12
Prior surgery			
No		44	26
Yes		126	74
Any family members with cancer			
No		145	85
Yes		25	15
Diagnosis			
Diagnosed with cancer		106	63
Cancer of the cervix		21	12
Corpus uteri		33	19
Cancer of the ovary		45	27
Other		8	5
Suspected to have cancer		64	37
Cancer of the cervix		26	15
Corpus uteri		3	2
Cancer of the ovary		22	13
Other		12	7

N = 170

Note. U.S. $1 = Hong Kong $7.8; United Kingdom £ 1= Hong Kong $13.

Note. Minor or medium surgery was defined as a surgical procedure for investigation or of relatively slight hazard to life; major surgery was defined as an extensive surgical procedure involving vital organs or hazards to life; ultra-major surgery was defined as very extensive, difficult, and multiple surgical procedures hazardous to life.

Characteristics of the Participants Perceiving a Higher Level of Anxiety

Levels of anxiety were compared among participants with different demographic characteristics. No demographic variables were found to be statistically significant in affecting such levels (see Table 4).

Table 2. Mean Scores on the Entire Scale and Subscales of the Medical Outcomes Study Social Support Survey–Chinese Version

Variable	$\bar{X}$	SD	Range
Total score	71.66	17.09	32–100
Tangible subscale	72.21	18.83	20–100
Emotional subscale	69.04	17.12	20–100
Affectionate subscale	73.8	20.26	20–100
Positive social interaction subscale	71.59	18.82	20–100

N = 170

Relationships Among Social Support, Uncertainty, and Anxiety

Table 5 shows the relationships among social support and the levels of uncertainty and anxiety among participants. Significant negative correlations were reported between anxiety and total social support score ($r = -0.189$, $p = 0.014$) and all subscales except tangible support ($p = 0.053$). Significant positive correlations were found between anxiety and both the C-MUIS total score ($r = 0.405$, $p < 0.001$) and all subscale scores, except that of complexity ($p = 0.471$).

Discussion

Intensity of Anxiety and Uncertainty

The mean state anxiety scores of the participants were 48.3 ± 11.58. Compared with previous studies examining anxiety in patients awaiting coronary artery bypass grafting (Koivula, Paunonen-Ilmonen, Tarkka, Tarkka, & Laippala, 2001) and before gynecologic surgery (Carr et al., 2006), the state anxiety of participants was higher in the present study. However, the anxiety levels in this population were consistent with the findings of Dropkin (2001), who studied levels of anxiety in patients undergoing head and neck surgery.

Most surgical patients perceive a certain degree of anxiety (Welsh, 2000), especially women undergoing surgery for gynecologic cancer because of the severity of the disease and the loss of femininity after treatment. Moreover, previous studies have demonstrated that such women express more worry at the preoperative stage and display greater heart-rate and blood-pressure changes (Cheung, Callaghan, & Chang, 2003; Welsh). Because studies have demonstrated the adverse impact of anxiety on postoperative recovery (Hughes, 2002; Kain, Sevarino, Alexander, Pincus, & Mayes, 2000), healthcare professionals should enhance their sensitivity in identifying the psychological needs of this particular group of patients.

The mean score of the C-MUIS was 92.27 (SD = 13.49), with a possible range of 33–165. Mast (1998) found that the overall mean score of uncertainty was 76 (SD = 15.9) in 109 breast cancer survivors who were living in North America and completed the treatment over one to six years. Similar results were reported by Dirksen and Erickson (2002), who examined the well-being of 50 Hispanic and 50 non-Hispanic white survivors of breast cancer ($\bar{X}_{Hispanic} = 74.2$, SD = 20.9; $\bar{X}_{non\text{-}Hispanic} = 67.6$, SD = 22.7). Taylor-Piliae and Molassiotis (2001) reported high mean scores of uncertainty ($\bar{X} = 101.4$, SD = 11.49) among 27 men hospitalized for cardiac catheterization.

Culture also may have been a factor in high levels of anxiety and uncertainty. In Chinese culture, open discussion about life-threatening illness such as cancer is uncommon because it is regarded as an indication of bad luck. Also, patients may not express themselves and their emotions openly because of the importance given to the virtues of tolerance and harmonious interpersonal relationships (Bond, 1991). Thus, Chinese patients may be reluctant to ask questions because they recognize the importance of harmony in relationships with healthcare professionals. Raising queries with doctors and nurses might give a false impression of challenging them. This also may explain why this sample of Chinese women perceived greater ambiguity than other factors of uncertainty. The relations among cultural factors, emotional concerns, and uncertainty factors are complex. Further research is needed to understand how uncertainty and anxiety may be influenced by Chinese culture.

Among the four uncertainty factors, participants perceived ambiguity as the most important. That participants perceived high levels of ambiguity during the preoperative period, when the state of their illness is vague, is not surprising. In fact, a physician cannot confirm the stage of a patient's disease before surgery and final pathology reports. Patients will be uncertain about the stage of cancer and the severity of their illness.

Table 3. Mean Scores on the Chinese Version of State Anxiety Inventory and Mishel's Uncertainty in Illness Scale (MUIS)

Variable	$\bar{X}$	SD	Range
State anxiety score	48.3	11.581	20–74
MUIS total score	92.27	13.486	48–128
MUIS ambiguity	41.33	8.332	17–64
MUIS complexity	16.54	3.069	7–26
MUIS inconsistency	19.22	4.443	7–30
MUIS unpredictability	15.18	2.723	6–23

N = 170

Table 4. Demographic and Clinical Factors That Affect Levels of Anxiety

Variable	State Anxiety $\bar{X}$	SD	df	t	F	p
Age (years)						
18–40	50.087	10.492	2,167		1.151	0.319
41–60	48.185	11.712				
61 or older	46.063	12.6				
Marital status						
Single, divorced, or widowed	46.729	11.49	168	–1.485		0.139
Married or cohabitating	49.4	11.574				
Occupation						
Unemployed, housewife, retired, or student	47.506	11.792	168	–0.915		0.361
Clerical, nonclerical, professional, or other	49.133	11.367				
Monthly household income (Hong Kong $)						
≤ 10,000	49.121	12.504	2,167		0.817	0.443
10,001–30,000	46.679	11.128				
> 30,000	49.032	9.687				
Educational level						
No formal education or primary	47.185	11.813	2,167		0.642	0.528
Secondary	48.442	11.772				
Tertiary or higher	50.524	10.177				
Religion						
No	49.108	10.783	127.593	1.079		0.282
Yes	47.088	12.67				
Living alone						
No	47.927	11.676	168	1.152		0.251
Yes	51.1	10.696				
Diagnosis						
Diagnosed with cancer	47.547	11.246	168	–1.091		0.277
Suspected to have cancer	49.547	12.101				
Severity of surgery						
Ultra-major or major	47.664	11.677	168	–1.385		0.168
Medium or minor	50.667	11.051				
History of anesthesia						
No	50.773	10.798	168	1.654		0.1
Yes	47.437	11.761				
Chronic disease						
No	48.641	10.292	145.786	0.408		0.684
Yes	47.897	12.995				

N = 170

Note. p is significant at 0.05.

Note. The level of anxiety was compared among participants with different demographic characteristics. No demographic variables were found to be statistically significant in affecting anxiety levels.

Characteristics of Participants Perceiving Higher Levels of Anxiety

Interestingly, anxiety was lower among patients who received major or ultra-major surgery than those who underwent minor or medium surgery, though the results were not statistically significant. This finding may reflect an adverse effect from the uncertainty of the disease on anxiety levels. Most of the minor and medium surgeries were performed for the purpose of investigation and diagnosis. Perhaps uncertainty about the diagnosis and treatment influenced levels of preoperative anxiety experienced by this group of patients. The study also found that patients with suspected cancer perceived higher levels of anxiety compared with those who were actually diagnosed with the disease, though the results were statistically insignificant. Further study with a larger sample is needed to facilitate better understanding of whether the uncertainty of preoperative diagnosis affects levels of anxiety among the same study population.

No variables were found to be statistically significant in affecting levels of anxiety in this population. One of the reasons may be the localized sampling in only one regional hospital, reducing the variety of demographic backgrounds among participants. The small sample also may have been a factor in these nonsignificant findings. In further studies, researchers should widen the variety of patients' backgrounds by conducting studies in several hospitals. The sample also should be increased to allow generalization of the findings.

Social Support, Uncertainty, and Anxiety

Despite the fact that no demographic or clinical variables were significant in influencing levels of anxiety, inadequate social support (emotional, affectionate, and positive social interaction support in particular) was associated with a high level of anxiety. The findings are consistent with previous studies on social support and its relation to fear and anxiety in patients awaiting coronary artery bypass grafting (Koivula, Paunonen-Ilmonen, Tarkka, Tarkka, & Laippala, 2002) and reflect the importance of psychosocial support for this particular group of patients.

The present study shows a positive relationship between uncertainty and anxiety. The total MUIS score and the subscales of ambiguity, inconsistency, and unpredictability were found to correlate statistically with anxiety levels. This result supports Mishel's proposition that uncertainty has an adverse effect on psychological well-being, which is consistent with numerous previous studies on the relationships among

uncertainty, emotional distress, anxiety, and depression across a variety of clinical populations (Bennett, 1993; Hawthorne & Hixon, 1994; Hilton, 1994; Mishel, 1981, 1997). Although the correlation between anxiety and the complexity subscale score was found to be insignificant, this should be interpreted with caution because of the low internal consistency of the subscale.

Limitations

The methodologic design of convenience sampling captured a wide spectrum of patients, recruiting a broad sample of different ages with different types of gynecologic cancers and operations. However, the method does reduce the possibility of generalizing the results to the Hong Kong population at large. Moreover, limited data collection in one regional hospital also affects generalization. The internal consistency of the C-MUIS complexity subscale is low. Because of these limitations, the results of the study should be interpreted with caution.

The use of a self-report instrument in the measurement of anxiety levels also may have some limitations, so a full picture of the anxiety experienced by preoperative women may be obscured. To achieve a deeper understanding of the anxiety experienced by women undergoing surgery for gynecologic cancer, a combination of qualitative and quantitative methods is recommended to generate a more holistic interpretation of their feelings than either of the two research methods might provide on its own (Barbour, 1999). Further studies of the sources of anxiety and its effects on patient outcomes also are suggested.

Implications

Results from this study should provide valuable information to healthcare professionals caring for women undergoing surgery for gynecologic cancer. A quick screening of the adequacy of social support can be carried out to identify the psychosocial needs of patients. A family meeting can be arranged to empower family members to offer better emotional and affectionate support to patients. Introduction to a peer support group may help patients to strengthen their social networks and interactions. Nurses working in gynecology clinics, preoperative clinics, women's health clinics, and gynecology wards and theaters can collaborate to provide emotional support and education to patients and their family members. Information on preoperative preparation is fundamental, including informed consent and surgical procedures. Moreover, postoperative instructions regarding rehabilitation, further postsurgery treatment plans, and ways of promoting health are important in decreasing uncertainty and hence anxiety levels.

Table 5. Correlations Among State Anxiety, Social Support, and Uncertainty

	State Anxiety	
Score	r	p
Total social support	–0.189	0.014*
Tangible support	–0.149	0.053
Emotional support	–0.169	0.027*
Affectionate support	–0.161	0.036*
Positive social interaction support	–0.209	0.006**
Mishel's Uncertainty in Illness Scale total	0.405	< 0.001**
Ambiguity subscale	0.407	< 0.001**
Complexity subscale	0.056	0.471
Inconsistency subscale	0.307	< 0.001**
Unpredictability subscale	0.197	0.01*

N = 170

* Significance at 0.05 level

** Significance at 0.01 level

Note. The findings in this table show that patients who had inadequate support (emotional, affectionate, and positive social interaction support in particular) were more likely to have a higher level of state anxiety. Also, patients with higher levels of uncertainty (ambiguity, inconsistency, and unpredictability in particular) were more likely to have a higher level of state anxiety.

Cultural factors, emphasizing the virtues of tolerance and harmonious interpersonal relationships, may inhibit Chinese patients from openly expressing their queries and emotions to healthcare professionals. This cultural behavior also may hinder healthcare professionals in recognizing their patients' information needs and identifying those with high levels of anxiety. Thus, incorporation of the measurement of anxiety into nursing assessment charts is essential. Once patients with high levels of anxiety are detected, patients can be referred to appropriate healthcare professionals for further examination and effective strategies to relieve the anxiety. Also, building good rapport between healthcare professionals and patients will help the latter to express their concerns openly.

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