**Name of Journal:** *World Journal of Obstetrics and Gynecology*

**Manuscript NO.:** 47841

**Manuscript Type:** ORIGINAL ARTICLE

***Observational Study***

**assessing quality of life using the brief cancer-related worry inventory for gynecological surgery**

Kikuchi A *et al*. Assessing QOL using the BCWI

Ami Kikuchi, Ryo Koide, Masahiro Iwasaki, Mizue Teramoto, Seiro Satohisa, Masato Tamate, Masami Horiguchi, Nozomi Niwa, Tsuyoshi Saito, Toru Mizuguchi

**Ami Kikuchi, Ryo Koide, Masami Horiguch**i, **Toru Mizuguchi**, Department of Nursing and Surgical Science, Sapporo Medical University Postgraduate School of Health Science, Sapporo 0608556, Japan

**Masahiro Iwasaki, Mizue Teramoto, Seiro Satohisa, Masato Tamate, Nozomi Niwa, Tsuyoshi Saito,** Department of Obstetrics and Gynecology, Sapporo Medical University Postgraduate School of Medicine, Sapporo 0608556, Japan

**ORCID numbers:** Ami Kikuchi (0000-0003-4763-2497); Ryo Koide (0000-0001-6522-9074); Masahiro Iwasaki (0000-0003-4152-8568); Mizue Teramoto (0000-0003-4866-5987); Seiro Satihisa (0000-0002-3503-0483); Masato Tamate (0000-0003-1447-9297); Masami Horiguchi (0000-0001-6490-9860); Nozomi Niwa (0000-0002-2498-7167); Tsuyoshi Saito (0000-0002-2335-5790); Toru Mizuguchi (0000-0002-8225-7461).

**Author contributions:** Kikuchi A and Mizuguchi T designed the study; Iwasaki M, Teramoto M, Satohisa S, Tamate M, and Saito T performed the operations and were responsible for patient management; Koide R and Niwa N helped with the patient care; Horiguchi M, Sawada I, and Shudo E contributed to the clinical protocol and data management; and Kikuchi A and Mizuguchi T wrote the paper.

**Supported by** Grant-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science, and Technology, Japan, No. 17K10672 (to Mizuguchi T); Astellas Pharma, Inc., Tokyo, Japan, No. RS2018A000763; Daiichi Sankyo Company, Tokyo, Japan, No. 1800461; Shionogi & Co., Osaka, Japan, No. RS2018A000439931; Merck Serono, Tokyo, Japan, No. MSJS20180613001; Sapporo Doto Hospital, Sapporo, Japan, No. 30037656; Noguchi Hospital, Otaru, Japan, No. 30047663; Doki-kai Tomakomai Hospital, Tomakomai, Japan, No. 30047674; Tsuchida Hospital, Sapporo, Japan, No. 30057704; and Ikuta Hospital, Shiraoi, Japan, No. 30057704.

**Institutional review board statement:** The study protocol has been reviewed and approved by the institutional review board of Sapporo Medical University Hospital, No. 302-56.

**Informed consent statement:** All study participants provided informed written consent prior to enrolment.

**Conflicts of interest statement:** None of the authors have any conflicts of interest related to this manuscript.

**Data sharing statement:** No additional data are available.

**STROBE statement:** The authors have read the STROBE Statement checklist of items, and the manuscript was prepared and revised according to the STROBE Statement checklist of items.

**Open-Access:** This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

**Manuscript source:** Unsolicited manuscript

**Corresponding author: Toru Mizuguchi, MD, PhD, Professor**, Department of Nursing and Surgical Science, Sapporo Medical University Postgraduate School of Health Science, S-1, W-16, Chuo-Ku, Sapporo, Hokkaido 060-8556, Japan. tmizu@sapmed.ac.jp

**Telephone:** +81-11-6112111-29460

**Fax:** +81-11-6125525

**Received:** March 28, 2019

**Peer-review started:** April 2, 2019

**First decision:** June 19, 2019

**Revised:** August 24, 2019

**Accepted:** October 9, 2019

**Article in press:**

**Published online:**

**Abstract**

***BACKGROUND***

The mental status of gynecologic patients has an important influence on their quality of life (QOL). Although high-quality QOL studies into breast cancer patients have been performed internationally, few QOL studies have examined patients with gynecological cancer.

***AIM***

To investigate the brief cancer-related worry inventory (BCWI) could evaluate the mental status of gynecological patients.

***METHODS***

Between July 2018 and December 2018, 19 consecutive gynecological cancer patients were prospectively recruited for this study. The BCWI is a 15-item self-reported questionnaire that assesses cancer-related worries on a numeric scale (0–100).

***RESULTS***

The high BCWI group was significantly younger than the low BCWI group. Regarding social status, the absence of a spouse and children was significantly more common in the high BCWI group than in the low BCWI group. The operation time was longer in the worsening BCWI group than in the stable BCWI group (305.3 ± 140.5 min *vs* 171.1 ± 97.2 min; *P =* 0.026).

***CONCLUSION***

Being young, having no family, and a long operation time were found to be risk factors for increased anxiety. Therefore, gynecological cancer patients should be assessed using the BCWI, and specific perioperative mental care should be considered for highly anxious patients.

**Key words:** Gynecology; Brief cancer-related worry inventory; Quality of life; Surgery

**© The Author(s) 2019** Published by Baishideng Publishing Group Inc. All rights reserved.

**Core tip:** The aim of this study was to evaluate the mental status of patients with gynecological cancer and identify their worries using the brief cancer-related worry inventory (BCWI). Regarding social status, the absence of a spouse and children was significantly more common in the high BCWI group than in the low BCWI group. The operation time was longer in the worsening BCWI group than in the stable BCWI group. Being young, having no family, and a long operation time were found to be risk factors for increased anxiety after gynecological surgery.

Kikuchi A, Koide R, Iwasaki M, Teramoto M, Satohisa S, Tamate M, Horiguchi M, Niwa N, Saito T, Mizuguchi T. assessing quality of life using the brief cancer-related worry inventory for gynecological surgery. *World J Obstet Gynecol* 2019; In press

**INTRODUCTION**

The mental status of cancer patients has an important influence on their quality of life (QOL)[1]. In addition, surgery for cancer can have a greater effect on mental status in females than in males, as it can involve the loss of breasts or the uterus[2,3]. Although high-quality QOL studies into breast cancer patients have been performed internationally[4–6], few QOL studies have examined patients with gynecological cancer.

A number of tools for assessing anxiety or worries have been established, such as the state-trait anxiety inventory, hospital anxiety and depression scale (HADS)[7], diagnostic and statistical manual of mental disorders-revised, impact of events scale-revised[8], short form health survey[9], and the brief cancer-related worry inventory (BCWI)[10].

The BCWI has been validated in breast and lung cancer patients, in which it exhibited excellent internal consistency and reliability[10]. The BCWI scale is composed of three subscales: (1) prospects; (2) physical and symptomatic problems; and (3) social and interpersonal problems[10,11]. Although the BCWI could be used to help patients to create problem lists in a very structured and effective way, no perioperative mental evaluations of gynecological patients have been carried out using the BCWI. Such a study would help medical staff to deeply understand the mental statuses of their patients and identify problems and solutions for improving patients’ QOL after surgery.

Therefore, this study aimed to evaluate the mental status of gynecological patients and identify their worries using the BCWI. Furthermore, we assessed the reliability of the BCWI in gynecological patients in a prospective cohort study.

**MATERIALS AND METHODS**

***Patients***

Between July 2018 and December 2018, 19 consecutive gynecological cancer patients who were scheduled to undergo hysterectomy or oophorectomy were prospectively recruited for this study after providing informed consent. Procedures to ensure the subjects’ anonymity were applied. The study protocol was approved by the internal review board of Sapporo Medical University (approval ID: 302-56; approval date: July 12, 2018).

***Assessment of the BCWI***

The BCWI is a 15-item self-reported questionnaire that assesses cancer-related worries on a numeric scale (0–100)[10]. The severity of worries is calculated by totaling the scores for each item. The inventory consists of three factors: (1) future prospects; (2) physical and symptomatic problems; and (3) social and interpersonal problems. All of the patients responded to the questionnaire by themselves immediately after admission and just before they were discharged from the surgical ward.

***Data collection***

Medical records were used to identify physical data, social data, the operation time, the amount of intraoperative bleeding, and the duration of each patient’s hospital stay. The surgical team and data collection team were independent and evaluated each patient.

***Statistical analysis***

SPSS (version 22, IBM-SPSS, Inc., Armonk, New York, United States) was used for all statistical analyses. The unpaired t-test was used for comparisons between the preoperative high BCWI group (≥ 700; *n* = 7) and the postoperative low BCWI group (< 700; *n* = 12). The paired t-test was used for comparisons of the differences between the preoperative BCWI and postoperative BCWI (*n* = 19). Levene’s test was used to assess the equality of variances for each variable between the two groups. Histograms with probability curves were obtained simultaneously. We calculated descriptive statistics and used the chi-square test to compare demographic data between the groups, when necessary. The internal consistency of each parameter was calculated based on Cronbach’s alpha. All results are expressed as mean ± sd values. *P*-values of < 0.05 were considered to be significant.

**RESULTS**

The patients’ clinical background data are shown in Table 1, and we divided the subjects into the high BCWI group (BCWI ≥ 700, *n* = 7) and low BCWI group (BCWI < 700, *n* = 12). Although the physiques of the high and low BCWI groups were similar, the patients in the high BCWI group were significantly younger than those in the low BCWI group (45.4 ± 8.8 *vs* 58.3 ± 11.7; *P =* 0.023). Regarding social status, the absence of a spouse and children was significantly more common in the high BCWI group than in the low BCWI group (*P =* 0.004 and *P =* 0.017).

The changes in the BCWI scores seen after surgery are shown in Table 2. Although the total BCWI scores obtained before and after surgery did not differ significantly (561.6 ± 367.8 *vs* 478.4 ± 339.1; *P =* 0.069), the scores for question 3 (Q3), which examined the effects of the current treatment (43.7 ± 31.8 *vs* 33.2 ± 34.1; *P =* 0.009), and Q6, which examined the patients’ mental status (43.2 ± 31.8 *vs* 29.4 ± 26.3; *P =* 0.007), were significantly decreased after surgery.

We then divided the patients into the stable BCWI group (*n =* 13) and worsening BCWI group (*n =* 6). The stable BCWI group consisted of the patients whose postoperative BCWI scores were equal to or lower than their preoperative BCWI scores (Table 3). The worsening BCWI group consisted of the patients whose postoperative BCWI scores were higher than their preoperative BCWI scores (Table 3). The operation time was longer in the worsening BCWI group than in the stable BCWI group (305.3 ± 140.5 min *vs* 171.1 ± 97.2 min; *P =* 0.026). As for social status, the absence of a spouse and children was only observed in the stable BCWI group (*P =* 0.004).

The internal consistency (Cronbach’s alpha coefficient) of the BWCI is shown in Table 3. Both the preoperative and postoperative BWCI scores exhibited excellent internal consistency (0.934 and 0.944, respectively).

**DISCUSSION**

We evaluated the anxiety levels of gynecological cancer patients who underwent hysterectomy or oophorectomy using the BCWI. As a result, we found that younger patients and those with no spouse and no children tended to have higher preoperative anxiety levels than elderly patients and patients with a spouse and children. Overall anxiety decreased after surgery, especially with regard to the effects of the current treatment and mental status. Furthermore, a longer operation time and the presence of a spouse and child could be risk factors for worsening anxiety after surgery.

A previous study showed that being younger than 50 years old was a risk factor for increased anxiety[12]. The age range of the subjects in the present study was 34 to 75 years old, and the mean age of the high BCWI group was 45 years old. In previous studies, female gender, a young age, being married, and a low educational level have been identified as aggravating factors that lead to increased preoperative anxiety among patients that undergo elective or emergency surgery[13,14]. Our study aimed to evaluate the anxiety levels of patients that undergo gynecological procedures; therefore, all of the subjects were female. Thus, among female patients anxiety might be greater in younger patients than in aged patients. Medical staff need to pay specific attention to the anxiety levels of young patients who undergo gynecological surgery.

Marital status affected the patients’ anxiety levels in different ways before and after surgery. Preoperatively, being married might relieve patients’ anxiety. On the other hand, in the postoperative period being married seemed to increase patients’ anxiety. The presence of a spouse and child has beneficial effects on mental health, which is related to decreased anxiety[15]. Also, another study pointed out that having no family was a risk factor for higher levels of preoperative anxiety[13]. Therefore, family support ameliorates anxiety when patients are in a stable state. On the other hand, patients worry about their families’ futures and the curability of their disease, which might increase their postoperative anxiety.

Previous studies have found that overall anxiety decreased after surgery[16,17], which is consistent with our results. We intended to identify the factors related to increased anxiety during the perioperative period. The operation time was longer in the worsening BCWI group than in the stable BCWI group. Doll et al. suggested that increased patient-reported baseline anxiety might increase postoperative healthcare resource use[16]. Furthermore, correlations have been detected between the operation time and a visual analog scale measuring the difficulty of the procedure[18]. It is difficult to determine the reason why a longer operation time would increase postoperative anxiety. However, it is possible that severe surgical stress is associated with greater pain, and that this causes increased anxiety. To clarify this issue, an additional study investigating the relationship between surgical stress and pain control should be performed in the future.

One of the limitations of this study was that the study period was short. It would be interesting to see if patients’ anxiety levels change over the long term. Changes in anxiety levels and emotions have been observed in patients that underwent surgery for gynecological tumors[16]. It would also be interesting to see whether a different scoring system, such as the functional assessment of cancer therapy, patient-reported outcomes measurement information system, or HADS, would produce different results.

Cronbach’s alpha is used to assess the correlations among test items and is known to be an internal consistency estimate of the reliability of test scores[19]. In the present study, all of the Cronbach’s alpha scores for the BCWI were over 0.7, which is acceptable, although scores of over 0.8 would have been preferable. Therefore, we demonstrated that the BCWI, which includes three subscales, exhibited excellent internal consistency among gynecological cancer patients, as has previously been demonstrated for breast and lung cancer patients[10].

In conclusion, the anxiety of gynecological cancer patients decreased after surgery. Being young, having no family, and a long operation time were identified as risk factors for increased anxiety. Therefore, specific perioperative mental care should be considered for high-risk gynecological cancer patients, who can be identified using the BCWI.

**ARTICLE HIGHLIGHTS**

***Research background***

The mental status of gynecological patients who received surgery has not fully understood. The brief cancer-related worry inventory (BCWI) has been validated in breast and lung cancer patients. However, the clinical values of BCWI for gynecological patients had never been investigated.

***Research motivation***

To identify the risk factors for perioperative anxiety could prepare for us supporting the patient’s mental status. It might improve a quality service of the medical management itself.

***Research objectives***

The main objectives, the objectives that were realized, and the significance of realizing these objectives for future research in this field should be described in detail.

***Research methods***

Between July 2018 and December 2018, 19 consecutive gynecological cancer patients who were scheduled to undergo hysterectomy or oophorectomy were prospectively recruited for this study after providing informed consent. The BCWI is a 15-item self-reported questionnaire that assesses cancer-related worries on a numeric scale (0–100).

***Research results***

The high BCWI group was significantly younger than the low BCWI group. The absence of a spouse and children was significantly more common in the high BCWI group than in the low BCWI group. The operation time was longer in the worsening BCWI group than in the stable BCWI group.

***Research conclusions***

We found that being young, having no family, and a long operation time were found to be risk factors for increased anxiety. Therefore, specific perioperative mental care should be considered for high-risk gynecological cancer patients, who can be identified using the BCWI, in the future.

**ACKNOWLEDGMENTS**

We thank professor Thomas T Hui (Department of Surgery, Stanford University, Stanford, CA, United States) for his help with the discussion. We also thank Ms. Miyako Nara for her technical assistance.

**REFERENCES**

1 **Sekse RJT**, Dunberger G, Olesen ML, Østerbye M, Seibaek L. Lived experiences and quality of life after gynaecological cancer-An integrative review. *J Clin Nurs* 2019; **28**: 1393-1421 [PMID: 30461101 DOI: 10.1111/jocn.14721]

2 **Salakari M**, Pylkkänen L, Sillanmäki L, Nurminen R, Rautava P, Koskenvuo M, Suominen S. Social support and breast cancer: A comparatory study of breast cancer survivors, women with mental depression, women with hypertension and healthy female controls. *Breast* 2017; **35**: 85-90 [PMID: 28667868 DOI: 10.1016/j.breast.2017.06.017]

3 **Armbruster SD**, Sun CC, Westin SN, Bodurka DC, Ramondetta L, Meyer LA, Soliman PT. Prospective assessment of patient-reported outcomes in gynecologic cancer patients before and after pelvic exenteration. *Gynecol Oncol* 2018; **149**: 484-490 [PMID: 29622276 DOI: 10.1016/j.ygyno.2018.03.054]

4 **Fujiwara M**, Inagaki M, Nakaya N, Fujimori M, Higuchi Y, Kakeda K, Uchitomi Y, Yamada N. Association between serious psychological distress and nonparticipation in cancer screening and the modifying effect of socioeconomic status: Analysis of anonymized data from a national cross-sectional survey in Japan. *Cancer* 2018; **124**: 555-562 [PMID: 29076156 DOI: 10.1002/cncr.31086]

5 **Ohnishi N**, Kataoka T, Okamura H. Relationships between roles and mental states and role functional QOL in breast cancer outpatients. *Jpn J Clin Oncol* 2011; **41**: 1112-1118 [PMID: 21816871 DOI: 10.1093/jjco/hyr104]

6 **Cohen L**, Hack TF, de Moor C, Katz J, Goss PE. The effects of type of surgery and time on psychological adjustment in women after breast cancer treatment. *Ann Surg Oncol* 2000; **7**: 427-434 [PMID: 10894138 DOI: 10.1007/s10434-000-0427-9]

7 **Lim CC**, Devi MK, Ang E. Anxiety in women with breast cancer undergoing treatment: a systematic review. *Int J Evid Based Healthc* 2011; **9**: 215-235 [PMID: 21884450 DOI: 10.1111/j.1744-1609.2011.00221.x]

8 **Barraclough J**, Pinder P, Cruddas M, Osmond C, Taylor I, Perry M. Life events and breast cancer prognosis. *BMJ* 1992; **304**: 1078-1081 [PMID: 1586819 DOI: 10.1136/bmj.304.6834.1078]

9 **Shim EJ**, Mehnert A, Koyama A, Cho SJ, Inui H, Paik NS, Koch U. Health-related quality of life in breast cancer: A cross-cultural survey of German, Japanese, and South Korean patients. *Breast Cancer Res Treat* 2006; **99**: 341-350 [PMID: 16685589 DOI: 10.1007/s10549-006-9216-x]

10 **Hirai K**, Shiozaki M, Motooka H, Arai H, Koyama A, Inui H, Uchitomi Y. Discrimination between worry and anxiety among cancer patients: development of a Brief Cancer-Related Worry Inventory. *Psychooncology* 2008; **17**: 1172-1179 [PMID: 18457339 DOI: 10.1002/pon.1348]

11 **Matsui T**, Tanimukai H. The use of psychosocial support services among Japanese breast cancer survivors. *Jpn J Clin Oncol* 2017; **47**: 743-748 [PMID: 28472443 DOI: 10.1093/jjco/hyx058]

12 **Mavridou P**, Dimitriou V, Manataki A, Arnaoutoglou E, Papadopoulos G. Patient's anxiety and fear of anesthesia: effect of gender, age, education, and previous experience of anesthesia. A survey of 400 patients. *J Anesth* 2013; **27**: 104-108 [PMID: 22864564 DOI: 10.1007/s00540-012-1460-0]

13 **Jawaid M**, Mushtaq A, Mukhtar S, Khan Z. Preoperative anxiety before elective surgery. *Neurosciences (Riyadh)* 2007; **12**: 145-148 [PMID: 21857597 DOI: 10.1007/s00234-006-0198-5]

14 **Karanci AN**, Dirik G. Predictors of pre- and postoperative anxiety in emergency surgery patients. *J Psychosom Res* 2003; **55**: 363-369 [PMID: 14507548 DOI: 10.1016/s0022-3999(02)00631-1]

15 **Yilmaz M**, Sezer H, Gürler H, Bekar M. Predictors of preoperative anxiety in surgical inpatients. *J Clin Nurs* 2012; **21**: 956-964 [PMID: 21812848 DOI: 10.1111/j.1365-2702.2011.03799.x]

16 **Doll KM**, Barber EL, Bensen JT, Snavely AC, Gehrig PA. The health-related quality of life journey of gynecologic oncology surgical patients: Implications for the incorporation of patient-reported outcomes into surgical quality metrics. *Gynecol Oncol* 2016; **141**: 329-335 [PMID: 26957479 DOI: 10.1016/j.ygyno.2016.03.003]

17 **Koizumi A**, Matsushima E, Mochizuki Y, Omura K, Amagasa T. Changes in the psychological characteristics of oral cancer patients in the perioperative period: a quantitative evaluation. *J Med Dent Sci* 2013; **60**: 41-53 [PMID: 23917961 DOI: 10.7494/mafe.2013.39.1.36]

18 **Aznar-Arasa L**, Figueiredo R, Valmaseda-Castellón E, Gay-Escoda C. Patient anxiety and surgical difficulty in impacted lower third molar extractions: a prospective cohort study. *Int J Oral Maxillofac Surg* 2014; **43**: 1131-1136 [PMID: 24837553 DOI: 10.1016/j.ijom.2014.04.005]

19 **Gorman SL**, Radtka S, Melnick ME, Abrams GM, Byl NN. Development and validation of the Function In Sitting Test in adults with acute stroke. *J Neurol Phys Ther* 2010; **34**: 150-160 [PMID: 20716989 DOI: 10.1097/NPT.0b013e3181f0065f]

**P-Reviewer:** Ulker K **S-Editor:** Ma YJ **L-Editor: E-Editor:**

**Specialty type:** Obstetrics and gynecology

**Country of origin:** Japan

**Peer-review report classification**

Grade A (Excellent): 0

Grade B (Very good): 0

Grade C (Good): C

Grade D (Fair): 0

Grade E (Poor): 0

**Table 1 Clinical demographics of the patients**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total** | **High BCWI** | **Low BCWI** | ***P*-value** |
| **(*n* = 19)** | **(*n* = 7)** | **(*n* = 12)** |
| Age (yr) | 53.5 ± 12.2 | 45.4 ± 8.8 | 58.3 ± 11.7 | 0.023 |
| Height (cm) | 158.9 ± 5.2 | 160.5 ± 5.2 | 157.9 ± 5.1 | 0.313 |
| Body weight (kg) | 64.4 ± 14.3 | 65.9 ± 19.2 | 63.5 ± 11.5 | 0.742 |
| BMI | 25.4 ± 5.4 | 25.4 ± 6.9 | 25.4 ± 4.6 | 0.996 |
| Pre-BCWI | 561.6 ± 367.8 | 945.7 ± 211.1 | 337.5 ± 219.9 | < 0.001 |
| Affected organ (UB:UN: OV) | 10:06:03 | 3:02:02 | 7:04:01 | 0.502 |
| History of surgery (Y:N) | 8:11 | 4:03 | 4:08 | 0.311 |
| Spouse (Y:N) | 13:06 | 2:05 | 11:01 | 0.004 |
| Child (Y:N) | 12:07 | 2:05 | 10:02 | 0.017 |
| Living with family (Y:N) | 15:04 | 5:02 | 10:02 | 0.539 |
| Friends (S:M) | 9:10 | 3:04 | 6:06 | 0.764 |
|  |  |  |  |  |

BMI: body mass index; BCWI: Brief cancer-related worry inventory; UB: uterine body; UN: uterine neck; OV: ovary; Y: yes; N: no; S: single; M: married.

**Table 2 Differences between the brief cancer-related worry inventory scores obtained before and after surgery in gynecological cancer patients**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Pre-BCWI** | **Post-BCWI** | ***P* value** |  | **Pre-BCWI** | **Post-BCWI** | ***P* value** |
| Total | 561.6 ± 367.8 | 478.4 ± 339.1 | 0.069 | Q8 | 36.8 ± 34.8 | 36.3 ± 36.5 | 0.943 |
| Q1 | 47.4 ± 36.2 | 47.9 ± 36.5 | 0.905 | Q9 | 24.2 ± 31.7 | 27.9 ± 29.9 | 0.521 |
| Q2 | 54.7 ± 36.7 | 48.9 ± 33.6 | 0.249 | Q10 | 15.8 ± 25.2 | 13.7 ± 17.1 | 0.52 |
| Q3 | 43.7 ± 31.8 | 33.2 ± 34.1 | 0.009 | Q11 | 21.6 ± 30.4 | 17.4 ± 21.8 | 0.534 |
| Q4 | 43.7 ± 30.9 | 36.8 ± 31.3 | 0.271 | Q12 | 37.9 ± 34.3 | 28.4 ± 30.9 | 0.104 |
| Q5 | 46.3 ± 34.5 | 37.9 ± 34.1 | 0.115 | Q13 | 24.7 ± 34.1 | 11.6 ± 11.7 | 0.096 |
| Q6 | 43.2 ± 31.8 | 29.4 ± 26.3 | 0.007 | Q14 | 40.0 ± 35.3 | 30.0 ± 34.1 | 0.194 |
| Q7 | 32.6 ± 31.9 | 31.6 ± 30.8 | 0.894 | Q15 | 32.1 ± 31.7 | 29.5 ± 31.4 | 0.499 |

BCWI: Brief cancer-related worry inventory; Q: question.

**Table 3 Clinical comparison between the stable brief cancer-related worry inventory group (*n* = 13) and the worsening brief cancer-related worry inventory group (*n* = 6)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Stable BCWI** | **Worsening BCWI** | ***P*-value** |
| **(*n* = 13)** | **(*n* = 6)** |
| Age (yr) | 54.8 ± 13.1 | 50.8 ± 107 | 0.53 |
| Height (cm) | 159.1 ± 6.1 | 158.7 ± 2.3 | 0.896 |
| Body weight (kg) | 65.5 ± 16.9 | 61.9 ± 6.6 | 0.634 |
| BMI | 25.8 ± 6.3 | 24.6 ± 2.7 | 0.665 |
| Pre-BCWI | 623.1 ± 413.8 | 428.3 ± 211.8 | 0.296 |
| Affected organ (UB:UN:OV) | 8:02:03 | 2:04:00 | 0.066 |
| History of surgery (Y:N) | 6:07 | 2:04 | 0.599 |
| Spouse (Y:N) | 7:06 | 6:00 | 0.044 |
| Child (Y:N) | 6:07 | 6:00 | 0.024 |
| Living with family (Y:N) | 10:03 | 5:01 | 0.75 |
| Friends (S:M) | 5:08 | 4:02 | 0.252 |
| Operation time (min) | 171.1 ± 97.2 | 305.3 ± 140.5 | 0.026 |
| Intraoperative Bleeding (ml) | 213.5 ± 279.5 | 649.2 ± 586.5 | 0.134 |
| Hospital stay (d) | 14.1 ± 8.8 | 19.2 ± 10.3 | 0.281 |

BMI: body mass index; BCWI: Brief cancer-related worry inventory; UB: uteruine body; UN: uterine neck; OV: ovary; Y: yes; N: no; S: single; M: married.

**Table 4 Reliability of the brief cancer-related worry inventory**

|  |  |  |
| --- | --- | --- |
|  | **Pre-Cronbach alpha coefficients** | **Post-Cronbach alpha coefficients** |
| Future prospects (Q1-Q6) | 0.95 | 0.953 |
| Physical and symptomatic problems (Q7-Q10) | 0.713 | 0.84 |
| Social and interpersonal problems (Q11-Q15) | 0.734 | 0.767 |
| Brief cancer-related worry (total) | 0.934 | 0.944 |