
GYNAECOLOGY

Sexual Health Status of Gynecological Cancer Survivors in King Chulalongkorn Memorial Hospital

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ABSTRACT

Objectives: The primary objective was to evaluate sexual health status of gynecological cancer survivors. The secondary objective was to identify the benefits of sexual health counselling in cancer survivors.

Materials and Methods: A prospective study was performed from June 2019 to February 2020. Inclusion criteria were sexually active patients before diagnosis of gynecological cancer, aged 18 years or more and could understand Thai language. Patients who refused to participate or answer the questionnaire or had an active psychiatric disorder were excluded. The questionnaire was created and used as a tool to assess the sexual health status of gynecological cancer survivors. The questionnaire was tested for validity and reliability before use. Questionnaires were given to participants and the participants answered the questionnaire by themselves. Baseline characteristics and details of the questionnaire were collected.

Results: One hundred and five participants were recruited. Mean age was 50.31 ± 10.26 years. Sixty-one patients (58.1%) had anxiousness and sexual health concerns. More than half of the participants never received sexual health information from physicians. Menopausal symptoms occurred in 53% of women. Sixty-two patients (59%) resumed sexual activity after complete treatment with mean duration of 9.23 ± 7.13 months. Factors related to the resumption of sexual activity was pre-menopausal status before treatment.

Conclusion: More than half of gynecological cancer survivors have sexual health concerns and need counselling. Gynecologic oncologists should discuss this aspect with patients to improve the quality of life of the patients.

Keywords: sexual health, gynecological cancer, cancer survivor, counselling.

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สุขภาพทางเพศในผู้ป่วยหลังการรักษามะเร็งนรีเวชในโรงพยาบาลจุฬาลงกรณ์

ลลิตา ไนยิตารกิจกุล, นิพนธ์ เขมเพชร, ชนิภา อิพารัตนพันธ์

บทคัดย่อ

วัตถุประสงค์: วัตถุประสงค์หลักของการศึกษานี้เพื่อประเมินสุขภาพทางเพศของผู้ป่วยหลังการรักษามะเร็งทางนรีเวช และวัตถุประสงค์รองเพื่อประเมินประยุกต์ในการให้คำแนะนำเกี่ยวกับเรื่องสุขภาพทางเพศแก่ผู้ป่วยเหล่านั้น

วัสดุและวิธีการ: เป็นการศึกษาแบบไปที่บ้านนำทำการศึกษาระหว่าง มิถุนายน 2562 ถึงกุมภาพันธ์ 2563 โดยมีเกณฑ์คัดเข้าคือ ผู้ป่วยมะเร็งนรีเวชที่มีเพศสัมพันธ์อยู่เป็นประจำก่อนที่จะได้รับการนิจฉัยว่าเป็นมะเร็งทางนรีเวช อายุ 18 ปีขึ้นไป และเข้าใจภาษาไทย โดยผู้ป่วยที่ปฏิเสธการตอบแบบสอบถาม หรือมีโรคทางจิตเวชที่กำลังได้รับการรักษาอยู่จะถูกคัดออกจากการศึกษาแบบสอบถามได้ถูกสร้างมาเพื่อการวิจัยนี้และได้รับการทดสอบความถูกต้องและความน่าเชื่อถือก่อนนำมาใช้ โดยผู้เข้ารับการวิจัยจะตอบแบบสอบถามด้วยตนเอง ปัจจัยพื้นฐานของผู้ป่วยรวมทั้งรายละเอียดในแบบสอบถามจะถูกเก็บเพื่อวิเคราะห์ผลการศึกษา: มีผู้เข้าร่วมวิจัยทั้งหมดหนึ่งร้อยห้าคน อายุเฉลี่ย 50.31 ปี ค่าเบี่ยงเบนมาตรฐาน 10.26 ปี มีผู้เข้าร่วมวิจัย 61 ราย (ร้อยละ 58.1) มีความกังวลเกี่ยวกับสุขภาพทางเพศและมากกว่าครึ่งของผู้เข้าร่วมวิจัยไม่เคยได้รับคำปรึกษาหรือแนะนำเกี่ยวกับสุขภาพทางเพศจากแพทย์ ร้อยละ 53 ของผู้เข้าร่วมวิจัยมีอาการของวัยทอง และร้อยละ 59 กลับไปมีเพศสัมพันธ์หลังการรักษาสิ้นสุดลง ระยะเวลาโดยเฉลี่ยตั้งแต่การรักษาสิ้นสุดลงจนเริ่มมีเพศสัมพันธ์คือ 9.23 เดือน ค่าเบี่ยงเบนมาตรฐาน 7.13 เดือน ปัจจัยที่มีผลต่อการกลับมา มีเพศสัมพันธ์ คือ อยู่ในวัยก่อนหมดประจำเดือนในช่วงก่อนการรักษามะเร็ง

สรุป: กว่าครึ่งของผู้ป่วยหลังการรักษามะเร็งนรีเวชมีความกังวลเกี่ยวกับสุขภาพทางเพศและต้องการคำแนะนำ แพทย์ผู้รักษามะเร็งนรีเวชควรจะให้คำแนะนำในประเด็นดังกล่าวพื่อเพิ่มคุณภาพชีวิตของผู้ป่วย

คำสำคัญ: สุขภาพทางเพศ, มะเร็งนรีเวช, ผู้ป่วยหลังการรักษามะเร็ง, การให้คำปรึกษา

Introduction

Gynecological cancer makes up nearly 25% of total cancer cases in Thailand with 14.2% accounting for cervical cancer, 5.3% endometrial cancer and 3.1% ovarian cancer^(1, 2). Current advancements in gynecological cancer treatment offer better outcomes of the disease treatment and improves the five-year survival rate of gynecological cancer patients to as high as 65%⁽³⁾. However, cancer treatment modality such as surgery, chemotherapy and radiotherapy have many consequences including shortening of vaginal length, loss of elasticity or moisture of vaginal mucosa, changes of body appearance, hair loss and hormone depletion⁽⁴⁾. These consequences have impacts on quality of life and sexual health. The World Health Organization (WHO) defined sexual health as a state of physical, emotional, mental and social wellbeing in relation to sexuality⁽⁵⁾.

Previous studies found that 40-60% of gynecological cancer survivors have sexual health problems, whether physical, quality of life or psychological issues⁽⁴⁻⁷⁾. Moreover, cancer survivors did not get adequate information or treatment about sexual health after cancer treatment^(3, 4, 8). Some patients do not dare to consult a doctor about sexual health problems. Moreover, some doctors focus only on the disease and are not concerned about sexual health of the patients. Therefore, sexual health problems would be underestimated and under treated. This study focused on some aspects of sexual health such as sexual concern, sexual resumption and associated factors in addition to sexual issues such as having concerns that the disease affected the family relationship, feeling loss of femininity, ability to talk or discuss sexual desire with their partner, etc.

This study mainly evaluated the proportion of anxiety and sexual health concerns in gynecological cancer survivors at King Chulalongkorn Memorial Hospital (KCMH) and secondary outcomes were aimed to evaluate the factors associated with resumption of sexual activity and the identification of the benefits from sexual health counselling for patients.

Materials and Methods

This prospective study was conducted after gaining approval from the Ethics Committee of the Institutional Review Board, Faculty of Medicine at Chulalongkorn University (IRB No. 235/62). Patients who attended the Gynecologic Oncology Clinic and Radiotherapy Clinic at KCMH between June 2019 and February 2020 were recruited. Sampling was performed by convenience sampling technique. The first 5 patients that the investigator met in each outpatient clinic session were asked to participate the study. The Inclusion criteria were gynecological cancer patients who completed treatment for at least 3 months. Patients were more than 18 years old and had to be sexually active before diagnosis of gynecological cancer. Patients were also required to understand Thai language. The exclusion criteria were patients who refused to participate or answer the questionnaire or had an active psychiatric disorder (such as schizophrenia, depressive disorder, or undergoing treatment of stress disorder). Patients who did not have a sexual partner were also excluded.

The sample size was calculated from the infinitive population proportion formula from a previous study which found that 48% of patients that had concerns that their cancer treatment affected their sexual health ($(p) = 0.48$)⁽⁶⁾ calculated with error (d) = 0.10 and alpha (α) = 0.05. The required sample size was 96. Ten percent was added to the sample size for patients who might be loss to follow-up.

All patients who met all the inclusion criteria and came for a follow-up visit at the out-patient department were informed about the objectives and details of the study by the researcher. Informed consent was signed voluntarily.

The questionnaire, which was designed and created this study, consisted of 2 parts. The first part was general information and sexual status such as age, education, menopausal status, sexual activity before and after cancer treatment, source of sexual health information and their feeling of anxiousness and concerns about sexual health, which was the primary objective of this study. The second part consisted of

14 questions inquiring about sexual health issues such as concern that the disease affected the family and other relationships, vaginal dryness, sexual activity issues and ability to talk or discuss about sexual desire with their partners (Appendix 1). Each item rating scale was scored from 1-5 rating by severity of the problem. The questionnaire was tested for validity by 3 Thai gynecologic oncologists. After that, the reliability was tested by test-retest analysis with 21 gynecological cancer patients who had similar characteristics to the study population. The reliability of this questionnaire was tested with intraclass correlation coefficient (ICC) using SPSS version 22 (SPSS Inc., Chicago, IL, USA). The reliability score for the questionnaire was 0.946 (Appendix 1). The questionnaires were completed by the patients in a private room at the out-patient department of the Gynecologic Oncology Clinic and Radiotherapy Clinic. Time to complete the questionnaire was approximately 10-15 minutes. After that, a counselling session was performed. Every counselling session was performed by single gynecologic oncologist fellow. Each session period was 15-20 minutes. Details of the counselling session included details of their disease, complications, general and sexual health problem including those that participants raised during the questionnaire such as fear that sexual activity may aggravate their disease or feeling anxious or depressed. The second visit was 12 weeks later. Questionnaires distributed and patients were asked to complete them again. The difference between first and second answers of the questionnaire were then analyzed. General characteristics and sexual health statuses were summarized and presented as primary outcomes (Table 1). This study also presented the characteristics that may be associated with sexual activity resumption after completion of treatment (Table 2). The variation of sexual health answer between the both queries within the 12-week interval were summarized and reported as a part of secondary outcomes (Table 3). Variations between the first and second answers may represent the effect of sexual health counselling.

Data was analyzed by SPSS version 22 (SPSS

Inc., Chicago, IL, USA). Descriptive statistics were used for demographic data and summarized as mean with standard deviation, median with range or frequency as appropriate. The secondary outcome, variation between the first and second answers of the 14 items, was analyzed with repeated Analysis of Variance (ANOVA) test. The different characteristics that may be associated with sexual activity resumption were analyzed with prevalence rate ratios (PRR) using Fisher's exact test.

Results

One hundred and six participants were recruited. All the patients that the researcher approached to participate in the study accepted the invitation. One participant was excluded due to incomplete data filling. Therefore, 105 cases were included. Mean age was 50.31 ± 10.26 years. Sixty-nine patients (65.7%) were in a pre-menopausal state at the time of diagnosis and treatment of cancer. Participants in the study had been diagnosed with ovarian cancer 43.8%, cervical cancer 28.6%, uterine cancer 16.2%, Gestational Trophoblastic Neoplasia (GTN) 7.6 % and other rare cancer 3.9%. Primary treatment, education level and sexual health status for gynecological survivors are reported in Table 1.

More than half of the participants had a husband as a current partner and caretaker. Fifty-six women (53.3%) had menopausal symptoms after cancer treatment. The frequency of pre-treatment sexual activity was reported. Sixty-two participants (59%) had resumed sexual activity. Forty-six participants (43.8%) reported that they had sexual activity more than once a week and 16 participants (15.2%) had less than once a week. The interval between completed treatment and resumption of sexual activity averaged about 9 months (range 1-36 months). Women who did not resumed sexual activity after treatment (41%) gave various reasons, such as being separated from her partner, fear of recurrent disease, or the lack of interest in sexual activity, etc. Fifty-eight participants (56%) had never received information or counselling from physicians or medical personnel. Sixty-one women

(58.1%) reported in the questionnaire that they felt anxious and concerned about their sexual health, while 59 women (56.2%) reported that they felt depressed because of concerns about their sexual health and their cancer disease. For those who reported that they

felt anxious or depressed in the questionnaire, the researcher proposed to consult a psychiatrist. However, most participants preferred to observe themselves and preferred to visit a psychiatrist when the symptoms get worse.

Table 1. Demographic characteristics and sexual status of women attending a gynecologic cancer clinic.

| Characteristics (n = 105) | n (%) |
|---|---------------|
| Age (year), mean (SD) | 50.31 ± 10.26 |
| Education | |
| Primary school | 31 (29.5%) |
| High school | 30 (28.6%) |
| Bachelor's degree | 44 (41.9%) |
| Treatments | |
| Surgery alone | 23 (21.9%) |
| Chemotherapy alone | 3 (2.8%) |
| Radiotherapy alone | 5 (4.8%) |
| Multimodality | 74 (70.5%) |
| Surgery and chemotherapy | 45 (42.9%) |
| Surgery and radiotherapy | 17 (16.2%) |
| Chemotherapy and radiotherapy | 12 (11.4%) |
| Menopause status | |
| Post-menopause | 36 (34.3%) |
| Pre-menopause | 69 (65.7%) |
| Menopausal symptoms | 56 (53.3%) |
| Hormonal replacement therapy | 11 (10.5%) |
| Pre-treatment sexual frequency | |
| ≤ 1 / week | 82 (78.1%) |
| > 1 / week | 23 (21.9%) |
| Post-treatment sexual activity | |
| No sexual activity after cancer treatment | 43 (41.0%) |
| Resumption sexual activity | 62 (59.0%) |
| Source of sexual health information ever obtain | |
| Physician, nurse | 47 (44.8%) |
| Internet, magazine, book | 18 (17.1%) |
| Other (friends, neighbors, etc.) | 23 (21.9%) |
| None | 36 (34.3%) |
| Anxiousness, concern about sexual health | 61 (58.1%) |
| Depress mood | 59 (56.2%) |

SD: standard deviation

The different characteristics that may associate with sexual activity resumption are presented in Table 2. Different cancer diagnosis, modality of treatment and

education were not associated with resumption of sexual activity. Only pre-menopause status before treatment was associated with the resumption of sexual activity.

Table 2. Characteristics associated with resumption of sexual activity (n = 105).

| Variables | Resume (n=62) n (%) | Not resume (n=43) n (%) | PRR (95%CI) | p value |
|--------------------------------|------------------------|----------------------------|-------------------|---------|
| Multimodality Treatments | | | | |
| Surgery and chemotherapy | 23 (37.1%) | 22 (51.2%) | 0.79 (0.56, 1.11) | 0.166 |
| Surgery and radiotherapy | 11 (17.7%) | 6 (14.0%) | 1.12 (0.75, 1.65) | 0.789 |
| Chemo and radiotherapy | 6 (9.7%) | 6 (14.0%) | 0.83 (0.46, 1.50) | 0.544 |
| Education | | | | |
| Primary school | 14 (22.6%) | 17 (39.5%) | 0.7 (0.46, 1.06) | 0.082 |
| High school | 21 (33.9%) | 9 (20.9%) | 1.28 (0.94, 1.75) | 0.189 |
| Bachelor's degree | 27 (43.5%) | 17 (39.5%) | 1.07 (0.78, 1.47) | 0.694 |
| Menopause status | | | | |
| Post-menopause | 13 (21%) | 23 (53.5%) | 0.51 (0.32, 0.81) | 0.001 |
| Pre-menopause | 49 (79%) | 20 (46.5%) | 1.97 (1.24, 3.11) | 0.001 |
| Pre-treatment sexual frequency | | | | |
| ≤ 1 / week | 44 (71%) | 38 (88.4%) | 0.69 (0.51, 0.92) | 0.053 |
| >1 / week | 18 (29%) | 5 (11.6%) | 1.46 (1.09, 1.96) | 0.053 |
| Menopausal symptoms | 36 (58.1%) | 20 (46.5%) | 1.21 (0.87, 1.68) | 0.320 |
| Hormone replacement therapy | 6 (9.7%) | 5 (11.6%) | 0.92 (0.52, 1.61) | 0.756 |

Data are presented as n (%) and prevalence rate ratios (PRR).

Comparing the score of sexual health items between the first and second queries and comparing scores between groups of resumption and non-resumption of sexual activity is shown in Table 3. The requirement for health information and counselling was significantly increased in both resume and never resume sexual activity groups, mean change + 0.6 (95% confidence interval (CI) 0.5-0.69, p < 0.001) (repeated ANOVA test). Anxiety/sexual health concern and depression symptoms were significantly lower in the resumed sexual activity group, with mean change -0.13 (95%CI -0.25--0.01, p 0.031) (repeated ANOVA test). Women who did not resume sexual activity showed a significantly poorer ability to talk about sexual

activity with their partners.

Almost all women were satisfied with their participation in this study. The women felt comfortable about discussing their symptoms regarding their sexual health as well as their disease aspects. Most participants preferred to complete the questionnaires in a private setting and needed counselling from a physician. They requested more time to discuss some issues about their sexual health. The most common topic that women raised for discussion was whether sexual activity could do harm to their cancer disease or affect the recurrence of the disease. After counselling, patients who did not resume sexual activity still did not resume sexual activity at the time of the follow-up visit.

Table 3. Differences of sexual health scores between patients who resumed sexual activity and did not resume sexual activity before and after counselling (first and second queries).

| Items | Total (n=105) mean \pm SD | Resume (n=62) mean \pm SD | Not resume (n=43) mean \pm SD | p value ^a |
|--|--------------------------------|--------------------------------|------------------------------------|----------------------|
| Requirement of information, counselling | | | | |
| First query | 0.38 \pm 0.49 | 0.44 \pm 0.50 | 0.30 \pm 0.46 | 0.165 |
| Second query | 0.98 \pm 0.14 | 1.00 \pm 0.00 | 0.95 \pm 0.21 | 0.160 |
| p value ^b | < 0.001 | < 0.001 | < 0.001 | |
| Anxiety symptoms, sexual health concern | | | | |
| First query | 0.85 \pm 0.82 | 0.81 \pm 0.76 | 0.91 \pm 0.89 | 0.538 |
| Second query | 0.73 \pm 0.71 | 0.68 \pm 0.62 | 0.81 \pm 0.82 | 0.360 |
| p value ^b | 0.004 | 0.031 | 0.044 | |
| Depression symptoms | | | | |
| First query | 0.78 \pm 0.78 | 0.77 \pm 0.73 | 0.79 \pm 0.86 | 0.919 |
| Second query | 0.66 \pm 0.70 | 0.61 \pm 0.61 | 0.72 \pm 0.83 | 0.467 |
| p value ^b | 0.001 | 0.006 | 0.083 | |
| Concern that the disease affected to work | | | | |
| First query | 3.52 \pm 1.32 | 3.52 \pm 1.29 | 3.54 \pm 1.38 | 0.939 |
| Second query | 3.58 \pm 1.32 | 3.60 \pm 1.27 | 3.56 \pm 1.40 | 0.893 |
| p value ^b | 0.014 | 0.024 | 0.323 | |
| Have sexual activity problems | | | | |
| First query | 3.70 \pm 1.34 | 3.32 \pm 1.32 | 4.32 \pm 1.16 | <0.001 |
| Second query | 3.76 \pm 1.32 | 3.42 \pm 1.30 | 4.33 \pm 1.17 | 0.001 |
| p value ^b | 0.033 | 0.033 | NA | |
| Vaginal dryness | | | | |
| First query | 3.12 \pm 1.32 | 2.81 \pm 1.27 | 3.69 \pm 1.23 | 0.001 |
| Second query | 3.21 \pm 1.34 | 2.90 \pm 1.31 | 3.76 \pm 1.21 | 0.002 |
| p value ^b | 0.032 | 0.057 | 0.325 | |
| Dyspareunia / painful intercourse | | | | |
| First query | NA | 3.13 \pm 1.32 | NA | NA |
| Second query | NA | 3.21 \pm 1.34 | NA | NA |
| p value ^b | NA | 0.096 | NA | NA |
| Trouble about orgasm | | | | |
| First query | NA | 3.03 \pm 1.15 | NA | NA |
| Second query | NA | 3.05 \pm 1.19 | NA | NA |
| p value ^b | NA | 0.659 | NA | NA |
| Ability to talk / discuss about sexual desire with partner | | | | |
| First query | 2.84 \pm 1.34 | 2.36 \pm 1.05 | 3.93 \pm 1.30 | <0.001 |
| Second query | 2.56 \pm 1.09 | 2.23 \pm 0.96 | 3.30 \pm 1.03 | <0.001 |
| p value ^b | <0.001 | 0.010 | 0.001 | |

Table 3. Differences of sexual health scores between patients who resumed sexual activity and did not resume sexual activity before and after counselling (first and second queries). (Cont.)

| Items | Total (n=105) mean \pm SD | Resume (n=62) mean \pm SD | Not resume (n=43) mean \pm SD | p value ^a |
|-------------------------------|--------------------------------|--------------------------------|------------------------------------|----------------------|
| Interested in sexual activity | | | | |
| First query | 3.81 \pm 0.98 | 3.42 \pm 0.86 | 4.55 \pm 0.75 | < 0.001 |
| Second query | 3.80 \pm 1.03 | 3.42 \pm 0.86 | 4.52 \pm 0.94 | < 0.001 |
| p value ^e | 0.657 | 1.000 | 0.662 | |
| Pleasure with sexual activity | | | | |
| First query | NA | 3.21 \pm 0.93 | NA | NA |
| Second query | NA | 3.18 \pm 0.94 | NA | NA |
| p value ^b | NA | 0.159 | NA | NA |
| Pleasure with everyday life | | | | |
| First query | 1.91 \pm 0.93 | 1.81 \pm 0.85 | 2.07 \pm 1.02 | 0.153 |
| Second query | 1.90 \pm 0.93 | 1.81 \pm 0.85 | 2.05 \pm 1.03 | 0.196 |
| p value ^b | 0.320 | 1.000 | 0.323 | |

Data are presented as mean \pm standard deviation (SD), and mean change (95%CI). P value corresponds to repeated ANOVA test.

NA = Not applicable

p value^a of test between column Resume and Not resume

p value^b of mean change between first and second query

Discussion

Sexual health is an important aspect of quality of life for gynecological cancer survivors. However, routine discussion about sexual health is limited as it may be due to the nature of Thai or Asian culture which implies that topics related to sex or sexual activity are impolite and private issues, rarely share with others. There are only a few studies about sexual health of gynecological cancer survivors in Thailand. Incidence of anxiousness and sexual health concerns in this study was 58.1% and as high as in previous Western studies⁽⁴⁻⁷⁾. Less than half of the women in this study received sexual health information from physician or healthcare personnel, which was similar to previous studies (40-70%)^(3, 4, 7, 9). Common symptoms were vaginal dryness, vaginal pain or dyspareunia, as similarly reported in previous study^(7, 10).

The outcomes in this study may not represent all sexual health status of gynecological cancer survivors because there are many related physical, mental and

cultural aspects should be considered. From our results, the frequency of pre-treatment sexual activity > 1 / week tended to associate with resumed sexual activity PRR 1.46 (95%CI 1.09-1.96, p= 0.053). Moreover, the score of "Interested in sexual activity" was significantly higher in women who did not resume sexual activity. This problem may need further exploration.

This study found that resumption of sexual activity was associated with age, menopause status and pre-treatment sexual activity frequency. Older age and post-menopause status had negative impacts on sexual activity resumption which was the same finding as the study of Tangjitgamol et al^(9, 11). Pre-treatment sexual activity frequency > 1 /week in this study had a positive impact on the resumption of sexual activity which was different from the results of Tangitgamol et al. However, these results may not be clearly comparable because of the difference in study population where Tangitgamol et al conducted their study in cervical cancer patients after treatment with

radical hysterectomy, while a majority participant from this study were ovarian cancer survivors.

The differences between the first and second query answers may represent the effect of sexual health counselling. Anxiety and depressive symptoms were significantly decreased after counselling. However, the rate of resumption of sexual activity did not increase after counselling. From the results of this study, most of the participants needed sexual health counselling but hesitated to start the conversation about this topic, which was similar with the results from previous studies⁽⁹⁻¹²⁾. Therefore, physicians should consider initiating discussions with women on topics of sexual health as routine surveillance to explore problems and offer further treatment as needed. The questionnaire may be used as an initiation tool of the sexual health counselling session to begin the conversation and reduce the patients' embarrassment. We found that the requirement for health information and counselling was significantly increased in both resumed and not resumed sexual activity groups. That means the single visit counselling may not be adequate. Counselling should be performed as a continuous process in multiple sessions.

To the best of our knowledge, only a few studies on sexual health in Thai gynecological cancer survivors have been conducted. However, since we evaluated the sexual health status of gynecological cancer survivors, our results may be useful for counselling and surveillance in this patient population. This study did have some limitations. For example, the stage of disease may affect sexual health. The sample size per each disease and each stage were too small to perform a subgroup analysis. Sexual performance of participant partners was not evaluated in this study as well. There were very few participants who had rare cancer such as vulva cancer, GTN or sarcoma therefore, application to those rare cancers may not be implied. Further study to explore the details of each disease, stage or rare cancer type is warranted. Moreover, this study was conducted in the manner of pre and post-intervention

evaluation. Therefore, response shift bias may have occurred even though the questionnaire was performed 12 weeks apart.

Conclusion

Gynecological cancer survivors had sexual health concerns and needed sexual health counselling. Gynecologic oncologists should discuss these matters with patients to improve their quality of life.

Potential conflicts of interest

The authors declare no conflicts of interest.

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Appendix 1. Reliability analysis-scale with intraclass correlation coefficient (ICC).

| Items | ICC | 95%CI |
|--|-------|----------------|
| Concern that the disease affected to family, relationship | 0.992 | (0.981, 0.997) |
| Concern that the disease affected to work | 0.981 | (0.954, 0.992) |
| Feeling loss of femininity | 0.994 | (0.984, 0.997) |
| Have sexual activity problems | 0.988 | (0.970, 0.995) |
| Vaginal dryness | 0.96 | (0.901, 0.984) |
| Dyspareunia / painful intercourse | 0.957 | (0.894, 0.983) |
| Trouble about orgasm | 0.941 | (0.854, 0.976) |
| Ability to talk / discuss about sexual desire with partner | 0.949 | (0.875, 0.979) |
| Appreciate in body, appearance that may change due to disease or treatment | 0.959 | (0.899, 0.983) |
| Felt that her partner understood the disease | 1 | (1.000, 1.000) |
| Interested in sexual activity | 1 | (1.000, 1.000) |
| Pleasure with sexual activity | 0.946 | (0.866, 0.978) |
| Pleasure with everyday life | 1 | (1.000, 1.000) |
| Proud of herself | 1 | (1.000, 1.000) |
| Reliability | 0.946 | (0.881, 0.967) |

CI: confidence interval