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Quality of sexual life and subjective well-being after treatment of patients with cervical cancer: an exploration of the different stages

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Abstract

Purpose: This study aimed to investigate the sexual function and subjective well-being of the CCSs in different stages, and to explore the relationship between sexual function and subjective well-being.

Methods: A cross-sectional study was used to investigate the sexual function and subjective well-being for CCSs(N=212). Basic demographic information about the CCSs was collected. Data were analyzed by a one-way analysis of variance and Pearson correlation analysis.

Results: The total scores of Female Sexual Function Index and Index of Well-being were different in different stages($P < 0.001$). As the stage progressed, both the sexual function index and well-being index was decreased. The Female Sexual Function Index in stage I to IV scores ranged from was 19.86(SD=7.53) to 2.12(SD=0.44), and Index of Well-being scores ranged from 7.91(SD=2.04) to 3.97(SD=0.90). From sub-dimension of sexual function and subjective well-being analysis, CCSs had different symptoms in different stages. In the

Pearson correlation analysis, there was a positive correlation between sexual function and subjective well-being($R^2=0.5214, P < 0.001$).

Conclusions: The quality of sexual life and subjective well-being of CCSs varied by stage, and the higher quality of sexual life, the higher subjective well-being. Health care workers should improve the awareness of sexual problems and provide personalized care according to different situations.

Keywords: Uterine cervical neoplasms, Sexual dysfunction, Quality of life, Subjective well-being, A cross-sectional study

1. Introduction

Cervical cancer (CC) is the fourth most common cancer and fourth leading cause of cancer death in women worldwide, which accounts for 569,847 new cases and 311,365 deaths annually (Bray et al., 2018). In China, there are 98,900 newly diagnosed CC cases annually (Chen et al., 2016). Moreover, China has shown an increasing trend of morbidity compared to the decreasing trend in transitioned countries, and the trend is in younger age. But with advances in effective screening and treatment, the overall 5-year survival rate was 85.6% (Chen et al., 2016; Wright et al., 2019). CC and its treatment can have a negative impact on patients' quality of life, especially sexual function. At present, several studies have confirmed the effects of surgery and postoperative radiotherapy on sexual behavior, which will last for several years (Le Borgne et al., 2013; Ye; Yang; Cao; Lang; Shen, 2014). Therefore, sexual health of survivors is considered an important component of quality of life (Ye; Yang; Cao; Lang; Shen, 2014).

Management of CC is primarily by surgery or radiation therapy, with chemotherapy a valuable adjunct. Surgery is suitable for early stages, where cervical conization, total simple hysterectomy, or radical hysterectomy may be selected according to the stage of disease and extent of spread of CC. Mid- and late-stage CC are suitable for mainly radiotherapy supplemented by chemotherapy (Bhatla; Aoki; Sharma; Sankaranarayanan, 2018).

At present, studies have shown that different treatment methods have different effects on the sexual function of cervical cancer patients. This study was to evaluate the sexual function in CCSs after radiotherapy (RT) or radical surgery (RS). After RT treatment, lubrication, orgasm,

satisfaction, pain have a significant impact. In RS treatment, except pain, there is no significant difference(Harding et al., 2014). In addition, there is a study on the sexual quality of life in patients with early CC(Fleming et al., 2016; Froeding et al., 2014).There is also a study of sexual function in patients with advanced CC (Grangé et al., 2013). Although there is growing concern about the sexual function of CCSs, the study on the quality of sexual life in each stage of CCSs has not been fully reported and there is less research on patients' feelings, especially subjective well-being. Whether the quality of sexual life of CCSs is different in different stages and quality of sexual life affects subjective well-being is still debated.

The aim of the present study was to better understand quality of sexual life and subjective well-being of the CCSs in different stages, and to explore the relationship between quality of sexual life and subjective well-being. Thus, this would provide the basis for the sexual health guidance.

2. Methods

A cross-sectional survey was conducted to assess the quality of sexual life and subjective well-being of CCSs who were followed up in the outpatient department of gynecology of three tertiary hospitals in Chongqing, China. The study was conducted from January to May 2022.

2.1. Participants

The target population of this study is CCSs who were followed up in the gynecological clinic of three tertiary hospitals. The inclusion criteria were: (1) According to the International Federation of Gynecology reported and Obstetrics (FIGO) standard, a diagnosis of stage IA1 ~ IVB cervical cancer;(2) At the age varied from 18 to 65 years old;(3) Patients were treated according to standard methods(Bhatla & Denny, 2018);(4) Treatment end time ≥ 3 months;(5) Patients with clear consciousness and clear language expression. Exclusion criteria were: (1) CCSs combined with cardiovascular and cerebrovascular diseases or other tumors, affecting the sexual life of patients;(2) Patients diagnosed with recurrent tumors. In this study, a total of 212 cases were sampled by convenient sampling.

This study was explorative by nature, thus, no formal sample size determination was done. But this study did follow the Kendall Principle (1975), which states that the number of

observations should be at least 10 times the number of variables, to estimate sufficient sample size(Sun; Gao; Yang; Zang; Wang, 2016).

2.2. Ethical considerations and data collection

The study was approved by the Ethics Committee of Second Affiliated Hospital of Chongqing Medical University, China (No:2019/26). Before collecting data, the researcher contacted gynecology clinic doctors in advance, understood the condition of patients. After, she communicated with patients who conformed to the standards. She also explained the purpose, content and methods of the investigation promising them to be anonymous and strictly confidential for all information. This helped to establish a good relationship between researcher and patients, gain the trust and the consent of patients. The patients logged into the questionnaire through scanned the two-dimensional code of WeChat, filled in the relevant content anonymously and submitted it, which took about 20 to 30 minutes. After completed the questionnaire, we presented patients with a small gift to express our gratitude. Authors had access to information that could identify individual participants during or after data collection.

2.3. Instruments

Data were collected using three questionnaires: Female Sexual Function Index (FSFI), Index of Well-being (IWB) and the participants' personal characteristic questionnaire.

The FSFI contains 19 items, covering six aspects of sexual life (sexual arousal, sexual desire, vaginal lubrication, orgasm, pain in sexual intercourse, and satisfaction with sex)(Rosen et al., 2000). Each of these aspects corresponds to several options of problem, with a minimum score of 2 points and full score of 36 points. The higher the total scores of FSFI, the better the patient's quality of sexual life; and the lower the score, the worse the quality of sexual life(Rosen et al., 2000). In this study, the internal consistency of the Chinese version of FSFI has a good faith, and the overall Cronbach's alpha coefficient was 0.92. The Cronbach's alpha coefficients for each sub dimension were 0.85, 0.77, 0.89, 0.87, 0.82, and 0.87.

The IWB was compiled by Campbell et al. in 1976 (Campbell, 1976). It measures the current level of subjective well-being, consisting of two parts: The Overall Emotion Index Scale (8 items) and Life Satisfaction (1 item). Each item used a seven-point scale. The total scores were the average scores of the first eight items add multiply the average scores of the last item by 1.1. The total scores range from 2.1 to 14.7, which can be divided into three grades: 2.1–6 are classified as low well-being; 6.1–10 are classified as moderate well-being;10.1–14.7 is classified as high well-being.

Personal characteristics include the following two aspects:

-(1) demographic information: It consisted of items relating to age, marital status, place of residence, education level, occupation, family income;

-(2) disease related information: CC clinical stages, treatment, after treatment time, recovery time of sexual life, frequency of sexual life; Have you actively consulted your Health care workers about sex questions? Whether you get knowledge of sex through the network or other channels? Have you discussed sexual issues with your spouse or partner after treatment?

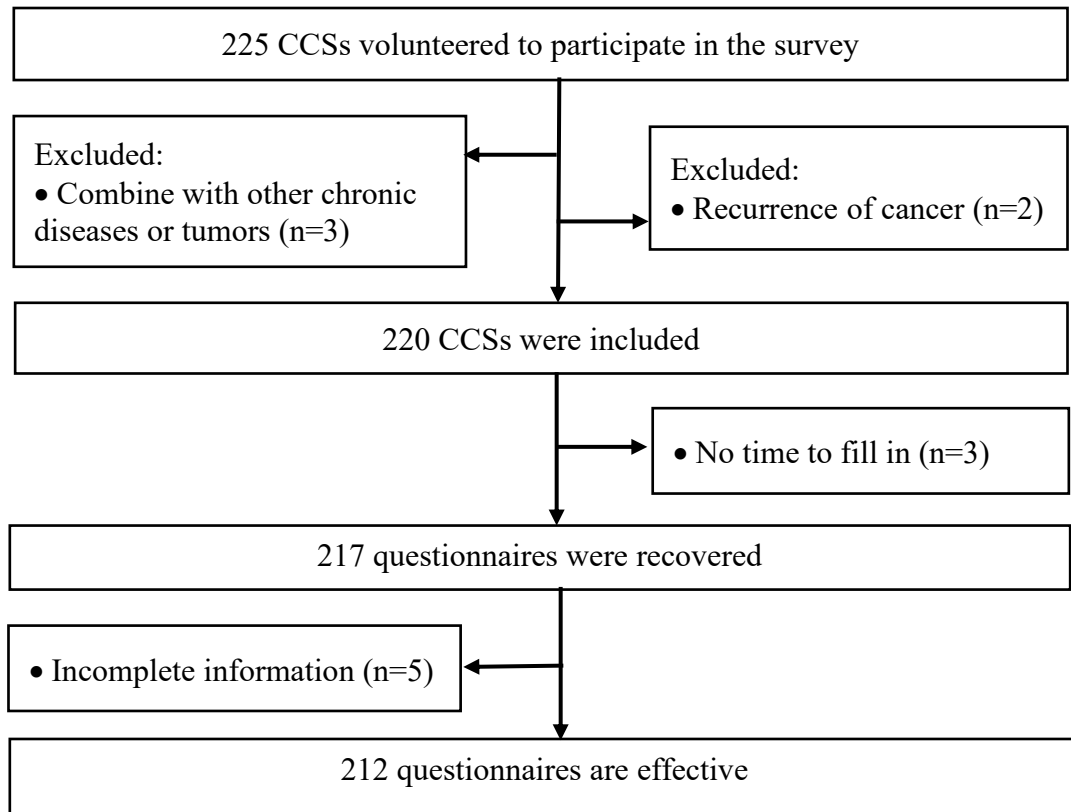
Quality of sexual life was regarded as the predictor variables, and subjective well-being was seen as the dependent variable.

2.4. Data analysis

The data were tabulated using Microsoft Excel. The statistical software package IBM SPSS Statistics for Windows version 22.0 was used to calculate descriptive indices. Demographic information was described in terms of frequency and percentage. Sexual function and well-being of patients at different stages were compared with a one-way analysis of variance. Pearson correlation analysis was used to analyze the correlation between sexual function and subjective well-being. Missing data were excluded from the analyses (n=8). P-values<0.05 were considered statistically significant.

3. Results

Of the patients invited to participate, 212 patients (**S1 Diagram, Flow diagram of participates inclusion**), ranging in age from 18 to 70 years (M=45.26, SD=2.37) completed the survey (a response rate of 98.6%). The personal characteristics of participants are reported in **Table 1**.



S1 Diagram. Flow diagram of participant inclusion.

Table 1 Participants' personal characteristics (N =212).

Personal characteristics		n (%)
Age	18-30	6(2.8%)
	31-40	43(20.3%)
	41-50	114(53.8%)
	51-60	40(18.9%)
	61-70	9(4.2%)
Marital status	Married/living with partner	150 (70.8%)
	Single/divorced/widowed	62 (29.2%)
Place of residence	Urban	138 (65.1%)
	Countryside	74 (34.9%)
Employment status	Unemployed/retired	128 (60.4%)
	Employed	84 (39.6%)
Educational level	Below elementary school	107(50.5%)
	Junior/senior high school	68 (32.1%)

	College or beyond	37 (17.4%)
Monthly family income	<3000	52 (24.5%)
(RMB)	3000-5000	83 (39.2%)
	5000-8000	54 (25.5%)
	>8000	23 (10.8%)
FIGO stage	IA1/IA2	81 (38.2%)
	IB1/IB2/IB3	64 (30.3%)
	IIA1/IIA2	20 (9.4%)
	IIB	18 (8.5%)
	IIIA/IIIB/IIIC	16 (7.5%)
	IVA/IVB	13 (6.1%)
Treatment methods	Surgery	58 (27.4%)
	Operation + chemotherapy/ radiotherapy	70 (33.0%)
	Operation + chemoradiotherapy	48 (22.6%)
	Radiation therapy	12 (5.7%)
	Radiation and chemotherapy	24 (11.3%)
How long after the	<1 year	53 (25.0%)
treatment	1-3 year	104 (49.1%)
	>3 year	55 (25.9%)
Recovery time of sexual life	3 months	28 (13.2%)
	Half a year	61 (28.8%)
	1 year	43 (20.3%)
	2 year	6 (2.8%)
	>2 year	13 (6.1%)
	Not recovered	61 (28.8%)
Frequency of sexual life	More than 4 times a week	7 (3.3%)
	3 to 4 times a week	7 (3.3%)
	Once or twice a week	36 (17.0%)
	Once or twice a month	61 (28.8%)
	Less than 1 time a month	40 (18.8%)
	None	61 (28.8%)

Have you actively	Yes	35(16.5%)
consulted your health	No	177 (83.5%)
care provider about		
sex questions?		
Whether you get	Yes	80 (37.7%)
knowledge of sex	No	132 (62.3%)
through the network		
and other channels?		
Have you discussed	Yes	43 (20.3%)
sexual issues with	No	169 (79.7%)
your spouse or partner after		
treatment?		

3.1. Scores of FSFI and IWB

The 212 patients and scores (total and sub dimension scores) are depicted in Figure 1, Figure2, Figure3 and Figure4. As the stage progressed, both the sexual function index and index of well-being were decreased.

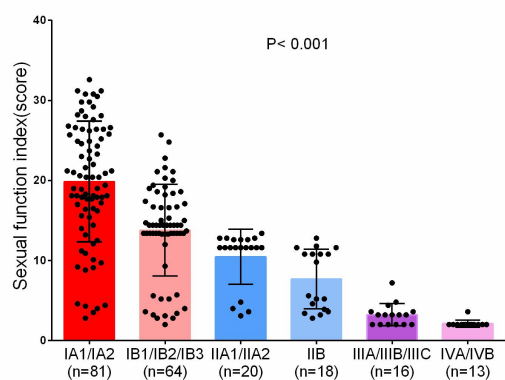


Fig 1. The total scores of sexual funtion index were compared in different stages (mean score [SD]).

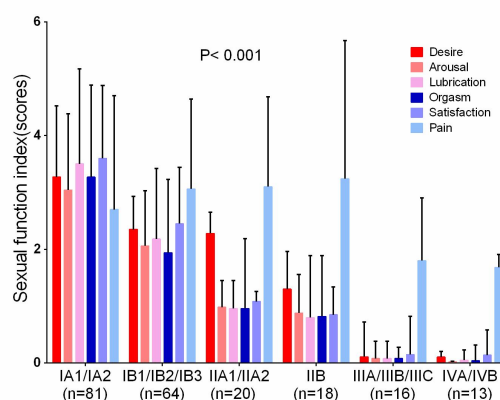


Fig 2. Sub-dimension scores of sexual function index were compared in different stages(mean score [SD]).

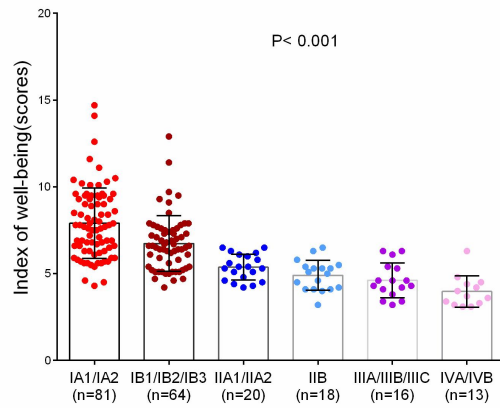


Fig 3. The total scores of well-being index were compared in different stages (mean score [SD]).

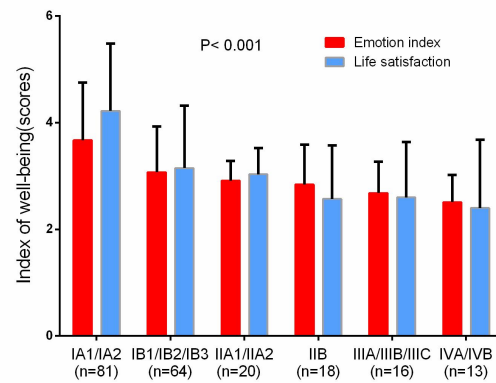


Fig 4. Sub-dimension scores of well-being index were compared in different stages(mean score [SD]).

For the FSFI, Figure 1 shows the total scores of sexual function index. There were significant differences in different stages ($P < 0.001$). IA1/IA2 were 19.86(SD=7.53), IB1/IB2/IB3 were 13.79(SD=5.71), IIA1/IIA2 were 10.48(SD=3.45), IIB were 7.68(SD=3.73), IIIA/IIIB/IIIC were 3.23(SD=1.39), IVA/IVB were 2.12(SD=0.44). Figure 2 shows sub- dimension scores of sexual function index. Each stage of the patients has significant pain. Patients in stage IB1/IB2/IB3, IIA1/IIA2 and IIB had more severe pain, while patients with III and IV stages had less pain. In addition, the stages have different characteristics from several dimensions other than pain. In stage IA1/IA2, patients' scores were lower on sexual arousal and orgasm compared to the other dimensions. In stage IB1/IB2/IB3, the scores of sexual arousal, vaginal lubrication, and orgasm were lower than other dimensions. In stage IIA1/IIA2 and stage IIB, it showed that little difference in sexual arousal, vaginal lubrication, orgasm, and sexual satisfaction scores, but patients had higher sexual desire in stage IIA1/IIA2 than that in stage IIB. The scores of stage III and stage IV were lower on all dimensions, but stage III was slightly higher than stage IV.

For the IWB, Figure 3 shows the total scores of index of well-being were different in different stages ($P < 0.001$). IA1/IA2 were 7.91(SD=2.04), IB1/IB2/IB3 were 6.74 (SD= 1.59), IIA1/IIA2 were 5.37 (SD= 0.75), IIB were 4.91 (SD=0.87), IIIA/IIIB/IIIC were 4.62(SD=1.01), IVA/IVB were 3.97(SD=0.90). Figure 4 shows both emotion index and life satisfaction varied in different stages ($P < 0.001$). The emotion index of the first three stages is lower than the life satisfaction scores, while the emotion index of the last three stages is higher than the life satisfaction score.

3.2. The impact of sexual function on the index of well-being

Figure 5 shows the correlation between sexual function and index of well-being, which are positively correlated($R^2=0.5214$, $P < 0.0001$) indicating that a higher index of sexual function will have a higher index of well-being.

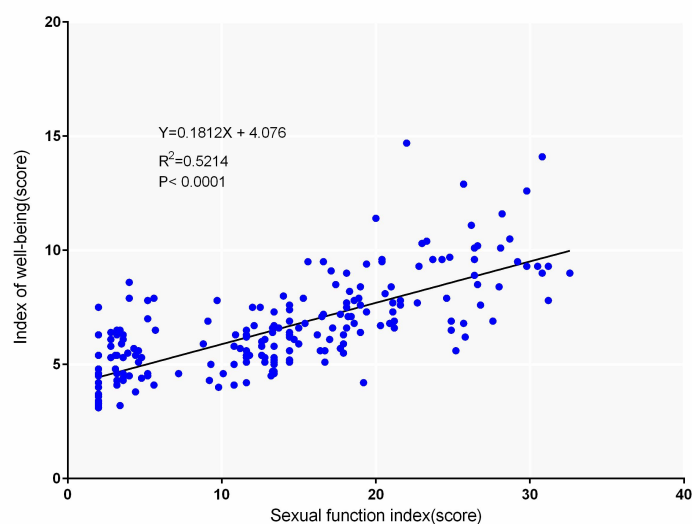


Fig 5. Pearson correlation analysis of sexual function index and well-being index.

4. Discussion

4.1. The sexual function index of CCSs in different stages

Sexual dysfunction is common among CCSs after treatment. As the stage progresses, the patient's sexual function continues to decline, with different symptoms. The findings of this study revealed that significant pain problems in each stage of patients, especially in stage II (IIA1 /IIA2, IIB). These results are in line with previous researches (Hofsjö et al., 2017) showing that radiation causes fibrosis in the vaginal connective tissue, which may result in inelasticity and pain during intercourse. It is possible that patients were sexually active during this period. But in stage III (IIIA/IIIB/IIIC, IVA/IVB) and stage IV (IVA/IVB), CCSs' pain was found to be less severe than that in stage I and stage II. It is possible that some patients did not report pain because they were sexually inactive or did not resume sexual intercourse(Ussher, 2014). In China, female sexuality is usually passively accepted, and the initiative to pursue sexual pleasure is sensuality behavior. This traditional culture has seriously affected people's awareness of sexual knowledge. Moreover, owing to the lack of knowledge and cognitive errors without medical personnel and guidance, they often avoid sexual life, which should be changed.

Furthermore, from sub-dimension of sexual function analysis, we found that in stage I (IA1/IA2, IB1/IB2/IB3), patients' sexual dysfunction was characterized by sexual arousal, difficulty in orgasm and pain, but the overall sexual function score was higher than that in other stages. In stage II (IIA1 /IIA2, IIB), patients' sexual dysfunction was characterized by difficulty in sexual arousal, low vaginal lubrication, difficulty in orgasm and pain of intercourse. Patients with stage III (IIIA/IIIB/IIIC) and stage IV (IVA/IVB) had very severe sexual dysfunction, and most of the patients did not recover sexual life. The few patients who have recovered sexual life almost had no sexual arousal, orgasm or it's very difficult to become lubricated and to reach orgasm. This may be related to the psychology of patients (Bakker et al., 2017). In fact, the later the stage of patients, the greater the psychological stress. They are most concerned about the changes in the disease, may lose interest in sexual life. What's more, the chronic suffering of cancer and the side effects of treatment, the weariness of the patient or partner, the conflict between the patient's fear of sex and the partner's desire for sex, and even the partner's repositioning of the cancer patient as a patient rather than a sexual partner are the main obstacles for those patients (Vermeer; Bakker; Kenter; Stiggelbout; Kuile, 2016). Partner avoidance and the level of the actors anxiety or avoidance had a direct influence on and increased the level of sexual dissatisfaction (Heresi Milad; Rivera Ottenberger; Huepe Artigas, 2014). Our results indicate that the later the stage, the worse the sexual function. However, in a previous study (Corrêa et al., 2016) shown that staging had no effect on sexual function, it may be related to the sample size of the survey or the cultural background of the patients.

4.2. The index of well-being of CCSs in different stages

The diagnosis and treatment of cervical cancer is considered a major life stress that has a potential impact on patients' psychological well-being. Furthermore, the integrated treatments of organs that serve reproductive and hormonal functions may have profound implications on female fertility, sexual function, self-identity, and so on (Pfaendler; Wenzel; Mechanic; Penner, 2015). In this study, we found that CCSs at different stages after treatment also had different index of well-being. The later the stage, the lower was the index of well-being. This results were consistent with the results of the study (Bae & Park, 2016) which showed that disease stage and complexity of treatment have been reported to increase the degree of depression. On the other hand, the progression of the disease can lead to fear, and changes within the family often occur late in the illness (Zeng; Ching; Loke, 2011).

Previous research has shown that about 45.4 % of them experienced more than a moderate level of depression (Bae & Park, 2016). These results indicate that patients have very low levels of well-being. In our study, we found something new, which from the two dimensions of emotion index and life satisfaction. The emotion index of patients in stage I (IA1/IA2, IB1/IB2/IB3) and early of stage II (IIA1 /IIA2) all were lower than life satisfaction. The patients who were in advanced of stage II (IIB), stage III (IIIA/IIIB/IIIC) and stage IV (IVA/IVB), the emotional indexes all were higher than life satisfaction. This may be due to the fact that patients adapt and come to terms with their condition over time. However, their overall life satisfaction remains low and they need more support, from family and society, especially partners. Partner plays an important role in the patient's adaptation to and joint fight against the disease, and he is the patient's closest supporter (Oldertrøen Solli; de Boer; Nyheim Solbraekke; Thoresen, 2019).

4.3. The sexual function of CCSs influencing the index of well-being

Sexual dysfunctions can result in severe psychosomatic distress (Graugaard, 2017). In our study, we found that CCSs with low sexual function tended to have low levels of well-being and exhibited a lower quality of life. On the contrary, patients with higher sexual quality had higher index of well-being. This result supports the findings of the study conducted by Bae H and Park H (Bae & Park, 2016). Between sexuality and health are positive correlations, and it is obvious that health and healthy lifestyles promote sexual expressions, both biologically and psychosocially. A fulfilling sexual life might reduce morbidity and perhaps even mortality of patients. Inversely, the positive effects of sexual activity on a number of physiological and psychosocial functions are well documented (De Berardis et al., 2002; Graugaard, 2017; Katz, 2005).

Sexuality is one of the indicators of quality of life influencing thoughts, feelings, actions, integrations, and thus, mental and physical health. This is multifactorial and has a complex structure, influenced by biological, psychological, socioeconomic, intellectual, religious and sociocultural factors (Corrêa et al., 2016). As always, health care workers have spent most of their time making diagnosis and treatment plans (Adams; Hill; Watson, 2013). Furthermore, because Chinese people have relatively conservative attitudes towards sex, the sexual health is rarely regarded in the quality of life assessment of women with cervical cancer (Tian, 2013). In the future, we should change the idea. As health care professionals, we should consider the patient's sexual function in treatment, to minimize the damage of sexual function, to improve

the quality of sexual life. A fulfilling intimate life can be a facilitator of well-being(Graugaard, 2017).

5. limitations

Our study has some limitations. First, we only analyzed sexual function and index of well-being in different stages, and the effects of other factors on patients were not analyzed. Second, because we examined only 212 patients, our results might have been due to chance. The results must be confirmed in a large study. Third, the generalizability of the findings is limited, as it's just a survey of one province of China.

6. Conclusions

Our findings suggest that CCSs have lower quality of sexual life and subjective well-being after treatment, and have different symptoms in different stages. The later the stage, the worse is the sexual function and the lower the well-being. Another important finding was that sexual function score was positively correlated with well-being, indicating that the higher the quality of sexual life, the higher the subjective well-being. In the future, health care workers should improve their awareness of the sexual health of CCSs, and provide personalized nursing according to the typical symptoms and emotion of patients in different stages. This would improve the quality of sexual life and subjective well-being, which finally improves quality of life.

Conflict of interest statement

The authors declare that there is no conflict of interest.

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