

Original Article

The Impact of Oncological Diseases on Sexual Behavior and Psychosocial Attitudes of Young and Adult Patients: A Systematic Review

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Abstract

Background: Young adults coping with cancer are in risk of facing changes in sexual behavior and intimate relationships. Moreover, due to treatment, they usually experience changes in body image and sexual function. Sexual behavior of cancer patients is considered a sensitive and rarely discussed issue.

Objective or Aims: To determine the impact of cancer on sexual behavior of young adults.

Methodology: This review was conducted in 2019 using the electronic data bases PubMed and Scopus. Primarily, articles were selected based on their titles and abstracts. Seventeen (17) original research articles were included in the narrative synthesis. Inclusion criteria consisted of English language, year of the study and population. Studies about patients suffering from HPV or HIV or both or other conditions in addition to cancer were not included. Patients were divided in two age groups, young people and young adults ($\leq 18-35$ years old) and young adults and adults (Median Age 35 years old and younger, $MD \leq 35$). Three reviewers were occupied with screening and narrative synthesis of the review, collectively.

Results: For analyzing the results, patients were divided according to their cancer diagnosis. Most female patients were facing sexual dysfunction, pain, vaginal dryness, libido loss and body image issues while male patients were coping with erectile dysfunction, difficulties achieving orgasm, pain and body image alterations.

Conclusions: After comparing the two age groups, female patients had common problems in both age groups, although women in the $MD \leq 35$ age group were also worried about fertility and ability to have children. Male patients had mutual problems in both age groups, however those in the $MD \leq 35$ group were also anxious about fertility, having children and finding a partner. Intercourse was a more important issue for men while women were more worried about their body image and having a supportive relationship.

Key words: sexual behavior, cancer, quality of life, young adults, young people, cancer symptoms.

Introduction

Sexuality, together with sex, sexual identity, orientation, intimacy, eroticism, pleasure and reproduction, is one of the most important

characteristics concerning the human behavior. All those aspects could be affected by cancer on a large scale. Patients diagnosed with cancer can experience alterations on sexual well-being.

These changes could be the result of acute treatment, psychological distress, altered body image and partners' handling of the disease. Most common types of cancer affecting sexual behavior are testicular and prostate cancer in men, breast and gynecologic cancer in women (Izycki, 2016). Usual types of treatment consist of chemotherapy, radiotherapy and surgery; orchiectomy and prostatectomy, mastectomy and hysterectomy in male and female patients respectively (Brand, 2015) (Huffman, 2015) (Izycki, 2016)(Kang, 2018).

Common symptoms of cancer treatment include fatigue, nausea, diarrhea, sleep disorders, urinary tract symptoms and pain (Izycki, 2016). As far as physical appearance is concerned alopecia and weight loss/gain are common issues faced by cancer patients (Tal, 2006). Moreover, psychological distress leads to loss of sexual desire, attractiveness and self-esteem. Sexual activity is also affected because patients face problems with sexual functioning such as erectile dysfunction, diminished genital size, ejaculation dysfunction among males and vaginal dryness, dyspareunia, premature menopause, pain during intercourse among females (Kang, 2018). Loss of libido, decreased interest and frequency of sexual activity, lack of sexual pleasure or satisfaction and difficulties with arousal and orgasm are common in both sexes (Izycki, 2016). Furthermore, the couple relationship is influenced by sexual changes that may cause emotional gaps among couples, feelings of unattractiveness, lack of communication between partners and negative feelings about intercourse. A good relationship with the partner constitutes a succoring/supporting factor in the coping process (Izycki, 2016) (Ussher, 2015). Finally, interest in sexual activity is connected with the age of the patient. Usually, the younger the patient the bigger the sexual desire. Young patients face difficulties in interpersonal relationships and are harder to adjust (Kennedy, 2015).

The hypothesis of this systematic review is if and how oncological diseases affect sexual behavior of young adults and young people. Further research questions include how sexual behavior is differentiated by patients' sex and age.

Methodology

Study type and search strategy

This paper is a systematic review. The identification of the articles took place in January

2019 via PubMed and Scopus data bases, using the following keywords: sexual behavior, cancer, quality of life, young adults, young people, cancer symptoms.

Inclusion criteria

The inclusion criteria were accessible articles written in English and published during the period 2008 to 2018. Only one study was published in 2019 but it was included because the online publication was in 2018. The main target group was young adults diagnosed with cancer aged 18-35. Studies concerning wider age groups, below 18 or over 35 years old, that contained the desired age range (18-35) were included. Twelve of seventeen study articles with age range wider than 35 years old were used because the mean age of the participants was 35 years old or lower. The results will be evaluated in two age groups: the first group will be concerning young people and young adults ($\leq 18-35$ years old) and the second, young adults and adults (Median Age 35 years old and younger, $MD \leq 35$). No gender or sexual orientation were considered. Only original research papers were reviewed.

Exclusion criteria

Studies about patients suffering from HIV or HPV or both or other conditions in addition to cancer were not included. Patients who do not undergo acute treatment and they lack of symptoms for more than five (5) years are considered survivors and they are excluded.

Assessment and selection of articles

The initial amount of records identified through electronic data bases (PubMed and Scopus) were 896 original research articles. Three duplicates were removed in the first step of screening. During the second step of screening, 857 studies were removed after reviewing titles and abstracts. Of the thirty six (36) full text articles assessed for eligibility, fourteen (14) were removed due to age range and five (5) because of no published results at the time, during the third step of the screening. Finally seventeen (17) studies were included in narrative synthesis. The final seventeen (17) original research papers examined certain types of cancer. The most common type in female patients was breast cancer, while in male patients was testicular cancer. Gynecologic cancers include endometrial, cervix uteri, cervical, ovarian, fallopian tube, peritoneal, vulvar, gestational trophoblastic neoplasia and

vaginal cancer. Other types of cancer include melanoma of the skin, haematological cancer, thyroid cancer, sarcoma, central nervous system, lymphoma, germ cell tumor, Hodgkin and non-

Hodgkin lymphoma, acute lymphocytic leukemia, acute myeloid leukemia and diffuse low-grade glioma.

Figure 1. Flowchart of the systematic review.

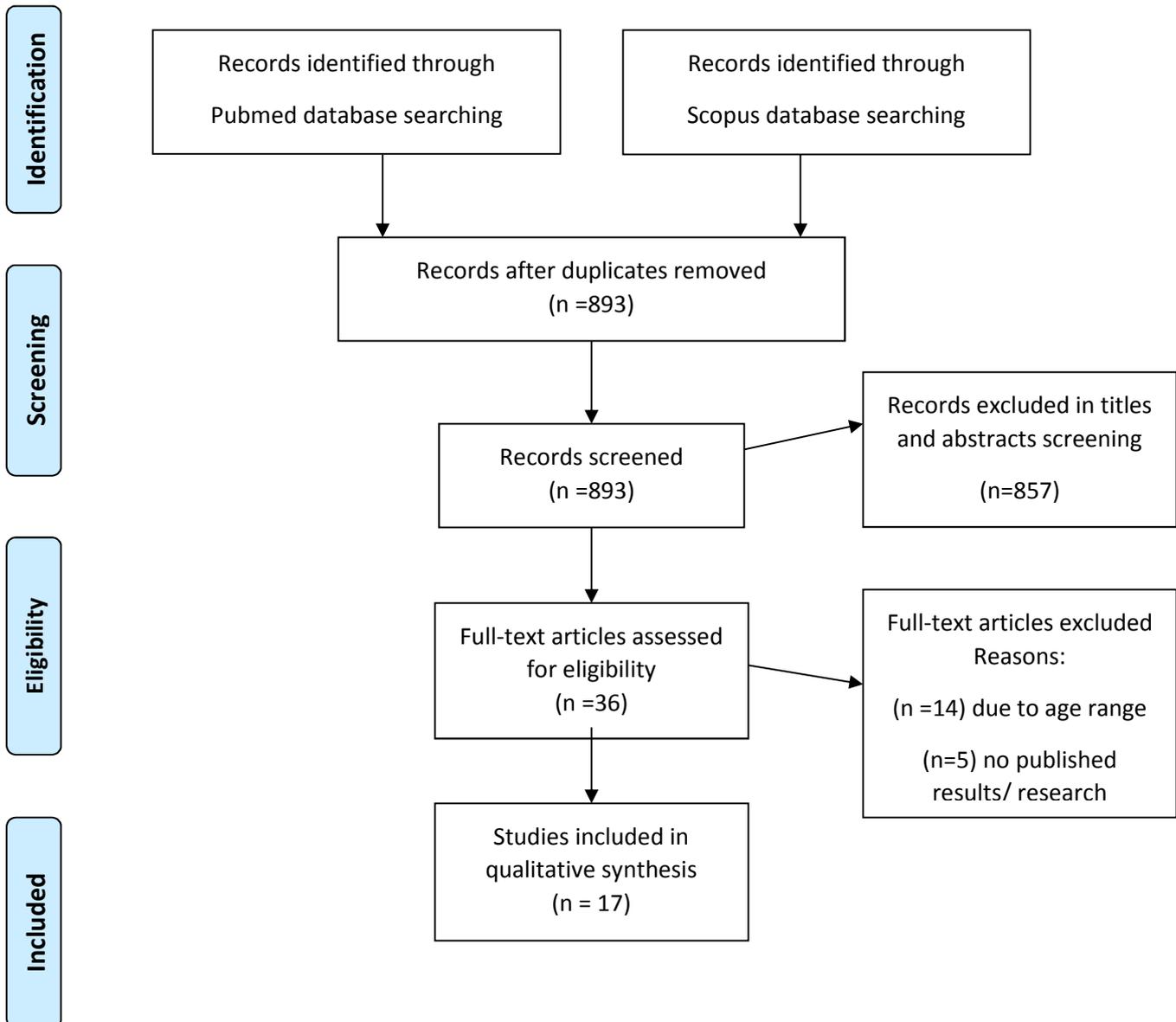


Table 1. Findings of the systematic review.

Increased number	Authors, Date of publication	Type of cancer	Population of study (number, sex, age)	Method	Important Findings
1	Blouet et al. (2019)	Breast cancer	84 women, 20-35 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • Domains with the biggest effect were sexual activity and orgasm. • Domains with the least effect were receptivity and relationship satisfaction. • Half of women treated for breast cancer reported a decrease in sexual desire. • 92% preserved the relationship, meaning more satisfaction and receptivity in their relationship. • Sexuality could be seen as a taboo or too personal to be approached in a medical visit.
2	Ljungman et al. (2018)	Breast cancer	181 women, 21-39 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • 79% were satisfied with their sex life before cancer. • 68% reported sexual dysfunction in at least one domain. • 40% reported vulvar discomfort of the labia as was the most common problem. • 51% stated a feeling of unattraction as the most important reason to not have sex with the partner. • 49% felt too tired. • 36% had vaginal pain or dryness.
3	Graugaard et al. (2018)	Melanoma of the skin, Cervix uteri cancer, Testicular cancer, Breast cancer, Haematological cancer, Thyroid cancer, Sarcoma	317 men, 505 women, 15-29 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • 53, 8% viewed their physical appearance more negatively after their diagnosis. • 44, 6% felt less attractive because of cancer. • Female patients were more negatively affected than male patients. • 65, 5% reported no change to their desire to flirt/date/have a partner after their cancer diagnosis. • 23, 6% stated negative consequences to their desire to flirt/date/have a

					<p>partner due to the disease.</p> <ul style="list-style-type: none"> • Breast cancer patients experienced more disruptions in romantic aspirations than patients with melanoma. • Female patients were significantly more at risk to show negative sexual desire than male responders. • 61, 7% were not or to a limited degree invited by a health professional to discuss sexual romantic aspects of the disease.
4	Stabile et al. (2017)	Gynecologic cancer, Breast cancer	218 women, 21-75 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • 109 women with breast cancer and 109 women with gynecologic cancer. • 29% unsatisfied with sexual functioning/vaginal health. • 70% felt somewhat-to-very concerned about sexual functioning/vaginal health. • 55% reported vaginal dryness. • 39% reported vaginal pain. • 51% reported libido loss. • 74% used vaginal lubricants. • 28% used moisturizers. • 28% tried pelvic floor exercises. • 70% preferred the topic to be raised by the healthcare team.
5	Wiklander et al. (2017)	Breast cancer, Cervical cancer, Ovarian cancer, Testicular cancer, Central Nervous System cancer, Lymphoma	19 women, 4 men, 18-43 years old	Mixed method. Quantitative, Questionnaire Qualitative, Interview	<ul style="list-style-type: none"> • 14 patients participated in the sexual quality program. • 11 were sexually active and mentioned sexual problems (decreased sexual interest, vaginal dryness, pain/discomfort, orgasm problems). • 9 patients participated in the fertility program. • They mentioned stress about fertility potential, about partner disclosure, health of future children.
6	Reese et al. (2017)	Breast cancer	28 women, adults younger	Qualitative, Interview	<ul style="list-style-type: none"> • Women with sexual concerns were suffering with sexual distress due to cancer. • They are concerned about

			than 45 years old		<p>body image rather than sexual function compared to the partnered ones.</p> <ul style="list-style-type: none"> • Communication obstacles between patients and health care providers due to lack of available treatment knowledge.
7	Olsson et al. (2017)	Breast cancer	605 women, 20-63 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • After the mastectomy women are importantly less satisfied with their physical and psychological health with their partnership and their sexual life in particular • More than 80% has psychological support from significant others. • Women satisfied with their work had a positive view of their life and had something creative to occupy themselves.
8	Rosenberg et al. (2017)	Sarcoma, Hodgkin lymphoma, Non Hodgkin lymphoma, Acute Lymphocytic Leukemia, Acute Myeloid Leukemia, Germ cell tumor	20 men, 15 women, 14-25 years old	Mixed method. Quantitative, Questionnaire Qualitative, interview	<ul style="list-style-type: none"> • Only 7 women and 6 men were in a relationship the first 6 months after diagnosis. Now 6 women and 3 men are sexually active. • Many young men described difficulties in sexual activity because of pain and other sexual dysfunctions. • Many women do not feel comfortable with their body and they believe that they are not desirable for relationship. • Many young people demonstrate risky behavior such as alcohol consumption, drug use and unprotected sexual activity.
9	Wettergren et al. (2017)	Non Hodgkin lymphoma, Hodgkin lymphoma, Germ cell	288 men, 177 women, 15-39 years old	Qualitative, Interview	<ul style="list-style-type: none"> • First interview, 1 year after diagnosis: <ul style="list-style-type: none"> ○ 49% negative effects on sexual activity. ○ 59% negative feelings of body appearance. ○ 46% negative impact on plans for having children. • Second interview, 2 years

		cancer, Acute lymphocytic, Leukemia, Sarcoma			<p>after diagnosis:</p> <ul style="list-style-type: none"> ○ 43% negative effects on sexual activity. ○ 50% negative feelings on body appearance. ● Negative perception of own physical appearance has negative impact on sexual function.
10	Brand, Williams & Braybrooke (2015)	Testicular cancer	21 men, 18-50 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> ● 35% were very satisfied with their sexual life. ● Men stress about: <ul style="list-style-type: none"> ○ 10% physical appearance. ○ 10% about having one testicle. ○ 25% about sex life. ○ 25% about testosterone levels. ○ 30% about the ability to have children. ○ 10% about the ability to find a new partner. ● Over the half wanted to be informed about sexual problems they might experience.
11	Kennedy et al. (2015)	Endometrial cancer, Breast cancer, Cervical cancer, Ovarian cancer, Fallopian tube, Peritoneal cancer, Vulvar cancer, Gestational trophoblastic neoplasia, Vaginal cancer and other	499 women, 18-91 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> ● Women 18-50 years old consider sex an important issue. ● Patients with diagnosed cancer were less common to have a partner or active sexual life in contrast to those on a diagnostic procedure. ● Ages 18-30: <ul style="list-style-type: none"> ○ 90, 5% have a partner. ○ 70, 7% consider sex an important issue. ○ 17, 8% have problems with sexual functioning. ○ 63, 3% had sexual problems in the last 12 months.
12					<ul style="list-style-type: none"> ● 53% stated a postoperative sexual change.

	Surbeck, Herbert & Duffau (2015)	Diffuse low-grade glioma	15 women, 17 men, 18-60 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • 88% stated subjective deterioration of sexual wellness. • 12% stated improvement. • Many patients do not ask for help due to embarrassment or because they don't consider sexual difficulties as a problem.
13	Lee et al. (2013)	Breast cancer	143 women, 18-50 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • Surgical treatments related to body image, such as mastectomy, had negative effects on sexual behavior and quality of life. • Patients undergoing breast conservation followed by standard whole-breast irradiation or no radiation reported lower interference scores in all domains.
14	Kedde et al. (2013)	Breast cancer	332 women , 22-49 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • Women undergoing breast cancer treatment struggle more with sexual stress, are less sexually satisfied, feel guiltier about their sexual behavior and have less sexual self-esteem. • Comparison of women undergoing treatment and healthy ones: <ul style="list-style-type: none"> ○ 42% versus 18% more frequently have no sexual fantasies. ○ 41% versus 25% more frequently do not masturbate at all. ○ 10% versus 4% masturbate less frequently, and more frequently have had no sexual contact with their regular partner in the past 6 months.
15	Carpentier et al. (2011)	Testicular cancer	21 men, 18-34 years old	Qualitative, Interview	<ul style="list-style-type: none"> • Men stated symptoms such as swollen testicle/scrotum or pain in the scrotal area/lower back for up to 2 months before seeking treatment.

					<ul style="list-style-type: none"> • Men felt differently from the healthy ones and they experienced problems in their sexual function and romantic relationships. • Altered body image due to chemotherapy had a negative effect.
16	Carter et al. (2010)	Cervical cancer	52 women, 18-45 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • The majority of patients chose treatment based on the effect on fertility and having children. • Anxiety about cancer treatment. • Improvement on quality of life after treatment. • They experienced sexual dysfunction, reduced orgasm frequency during sexual activity
17	Tuinman et al. (2010)	Testicular cancer	93 men, 15-40 years old	Quantitative, Questionnaire	<ul style="list-style-type: none"> • Sexual dysfunction increases after the first year of orchiectomy. • Significant time effects on erectile function, orgasmic function, intercourse satisfaction and overall satisfaction were found. • Singles reported worse functioning than committed patients over the year. • There was a significant interactive effect of time and relationship status on sexual desire and overall satisfaction. • Singles showed lower overall satisfaction compared to the partnered ones at all measurement times. • Partnered patients reported more satisfaction during intercourse than singles.

Table 2. Result grouping.

REFERENCES	AGE	POPULATION	CANCER	PROBLEMS
Blouet et al. (2019)	≤18-35	84 ♀	Breast	Sexual activity and orgasm problems, decreased sexual desire, 92% preserved relationship satisfaction, sexuality considered as a taboo.
Kennedy et al. (2015)	≤18-35	46 ♀	Breast, Gynecologic, Other types	Sex is considered an important problem, sexual dysfunction, the majority had sexual problems.
Carpentier et al. (2011)	≤18-35	21 ♂	Testicular	Swollen testicle/scrotum, pain in scrotal/lower back, sexual dysfunction, problematic romantic relationship, negative effect of altered body image.
Graugaard et al. (2018), Rosenberg et al. (2017)	≤18-35	520 ♀ 337 ♂	Breast, Gynecologic, Testicular, Other types	Men: sexual dysfunction and pain. Women: altered body image and feeling unattractive. Female patients were more at risk to show negative sexual desire than men.
Ljungman et al. (2018), Stabile et al. (2017), Reese et al. (2017), Olsson et al. (2017), Lee et al. (2013), Kedde et al. (2013)	MD≤35	1398 ♀	Breast	Sexual dysfunction, vaginal dryness/pain, mastectomy had negative impact on sexual behavior and QoL, vulvar discomfort, dyspareunia, arousal difficulties, feeling unattractive, feeling tired, libido loss, sexual stress, body image issues, less sexual satisfied, guilty about sexual behavior, less sexual self-esteem, less sexual fantasies, less masturbation, less sexual activity.
Carter et al. (2010)	MD≤35	52 ♀	Gynecologic	Anxiety about cancer treatment, sexual dysfunction, reduced orgasms, less sexual activity, improvement in QoL after treatment, therapy choice based on fertility.
Brand, Williams & Braybrooke (2015), Tuinman et al. (2010)	MD≤35	114 ♂	Testicular	Erectile dysfunction, sexual dysfunction, orgasm dysfunction & intercourse dissatisfaction. Most were unsatisfied with their sexual life. Stress about: physical appearance, having one testicle, sex life, testosterone levels, ability to have children, ability to find a new partner.
Wiklander et al. (2017), Wettergren et al. (2017), Surbeck, Herbet & Duffau (2015)	MD≤35	211 ♀ 309 ♂	Breast, Gynecologic, Testicular, Other types	Decreased sexual interest, vaginal dryness/pain, vaginal discomfort, orgasm problems, altered body image has negative effect on sexual function, stress about fertility and partner disclosure. The majority's sexual wellness deteriorated.

Results

Age group $\leq 18-35$ years old

Female patients coping with breast cancer.

According to the results of scanning, eighty four (84) female patients treated for breast cancer reported a decrease in sexual desire, problems during sexual activity and achieving orgasm. Although most of them preserved satisfaction in their relationship, many considered sexuality as a taboo and did not discuss it with health professionals. Forty six (46) women were diagnosed with breast, gynecologic or other types of cancer. This group considered intercourse as an important factor affecting quality of life, the majority had a partner and was dealing with sexual problems during treatment. Some of them also suffered from sexual dysfunction.

Male patients coping with testicular cancer.

Twenty one (21) male patients diagnosed with testicular cancer reported symptoms of swollen testicle or scrotum and pain in the scrotal area or lower back. Due to chemotherapy they experienced alterations in body image that affected them negatively and combined to sexual dysfunction they faced problems in their romantic relationship.

Studies with both female and male patients coping with various types of cancer

In this group there were five hundred and twenty (520) female patients suffered from breast, gynecologic and other types of cancer experienced mostly dissatisfaction with body image, feelings of unattractiveness and loss of sexual desire while three hundred (337) and thirty seven male patients coping with testicular and other types of cancer were mainly concerned about sexual dysfunction and pain during intercourse.

Age group $MD \leq 35$ years old

Female patients coping with breast cancer.

This group was consisted of one thousand three hundred eighty eight (1398) female patients reported sexual dysfunction, vaginal dryness or pain, vulvar discomfort, dyspareunia, arousal difficulties, libido loss and fatigue. In the matter of psychological health they experienced altered body image, feelings of unattractiveness and guilt, lower self-esteem, less sexual fantasies, decreased frequency of masturbation, sexual activity and satisfaction.

Female patients coping with gynecologic cancer

Fifty two (52) women suffering from gynecologic cancer stated sexual dysfunctions, reduced orgasm and sexual activity frequency. Many of them were anxious about their treatment and chose it based on the effect it had on fertility and having children. However, quality of life improved after treatment.

Male patients coping with testicular cancer.

Of the one hundred and fourteen (114) patients diagnosed with testicular cancer, most were unsatisfied with their sexual life. Common difficulties in sexual activity were erectile dysfunction, orgasm achievement and intercourse satisfaction. Additionally their sexual dysfunction increased after the first year of orchiectomy. They were also stressed about their physical appearance because of having one testicle after orchiectomy. Sex life, low testosterone levels, incapability of having children and finding a new partner were also reasons to stress about.

Studies with both female and male patients coping with cancer

In this group there were two hundred and eleven (211) female patients coping with breast, gynecologic and other types of cancer and three hundred and nine (309) male patients suffering from testicular and other types of cancer whom experienced decreased sexual interest, vaginal dryness or pain and vaginal discomfort. There was a reduction of orgasm frequency and alterations in body image which affected sexual activity negatively. There were also stress about fertility and partner disclosure that led to deterioration of the majority's sexual wellness.

Discussion

After analyzing the results, most common type of cancer in female patients was breast cancer, while in male patients was testicular cancer. Most patients from both sexes belonged in the $MD \leq 35$ age group.

Regarding female patients in the age group $\leq 18-35$, most common symptoms were decrease of sexual desire, decrease of orgasm's and sexual activity's frequency, sexual dysfunctions and alterations in body image. Concerning female patients in the $MD \leq 35$ age group, most of them were facing sexual dysfunctions, libido loss, problems achieving orgasms and body image issues. Although all the above symptoms were

mutual in both age groups, older women were also anxious about fertility and ability to have children while younger women considered sex as an important factor affecting quality of life (QoL).

Male patients in both age groups faced common symptoms as sexual/erectile dysfunction, pain during the sexual activity, orgasm difficulties and body image alterations. However, older men were worried about fertility, ability to have children and finding a partner. Sex was an important issue for all male patients.

Comparing both sexes, women worried more about body image alterations than men, who worried mostly about sexual dysfunction and pain during intercourse. Both male and female patients, in the MD \leq 35 age group, were concerned about fertility. Intercourse was a more important issue for men than women who preferred having a good and supporting relationship. It was also observed that women with breast cancer had more negative view of their body image than those with other types of cancer. In conclusion, sexual behavior was researched more in female than male patients coping with cancer.

References

- Blouet A., Zinger M., Capitain O., Landry S., Bourgeois H., Seegers V. & Pointreau Y. (2019) Supportive Care in Cancer 27:879-885.
- Brand S., Williams H. & Braybrooke J. (2015). How has early testicular cancer affected your life? A study of sexual function in men attending active surveillance for stage one testicular cancer. *European Journal of Oncology Nursing* 19:278-281.
- Carpentier M., Fortenberry J., Ott M., Brames M. & Einhorn L. (2011). Perceptions of Masculinity and Self-Image in Adolescent and Young Adult Testicular Cancer Survivors: Implications for Romantic and Sexual Relationships. *Psycho-Oncology Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 20:738-745.
- Carter J., Sonoda Y., Baser R., Raviv L., Chi D., Barakat R., Iasonos A., Brown C. & Abu-Rustum N. (2010). A 2-year prospective study assessing the emotional, sexual and quality of life concerns of women undergoing radical trachelectomy versus radical hysterectomy for treatment of early-stage cervical cancer. *Gynecologic Oncology* 119:358-365.
- Graugaard C., Sperling C., Holge-Hazelton B., Boisen K. & Petersen G. (2018). Sexual and romantic challenges among young Danes diagnosed with cancer: Results from a cross-sectional nationwide questionnaire study. *Psycho-Oncology Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 27:1608-1614.
- Huffman L., Hartenbach E., Carter J., Rash J. & Kushner D. (2016). Maintaining Sexual Health throughout Gynecologic Cancer Survivorship: A Comprehensive Review and Clinical Guide. *Gynecologic Oncology* 140:359-368.
- Iżycki D., Woźniak K. & Iżycka N. (2016). Consequences of gynecological cancer in patients and their partners from the sexual and psychological perspective. *Menopause Review* 15:112-116.
- Kang H., Kim H., Park S. & Kim J. (2018). Online-based interventions for sexual health among individuals with cancer: a systematic review. *BMC cancer* 18:167.
- Kedde H., Van de Wiel H., Schultz W. & Winjsen C. (2013). Subjective sexual well-being and sexual behavior in young women with breast cancer. *Supportive Care in Cancer* 21:1993-2005.
- Kennedy V., Ambramsohn E., Makelarski J., Barber R., Wroblewski K., Tenney M., Lee N., Yamada S. & Lindau S. (2015). Can you ask? We just did! Assessing sexual function and concerns in patients presenting for initial gynecologic oncology consultation. *Gynecologic Oncology* 137:119-124.
- Lee M., Bhati R., Von Rottenthaler E., Reagan A., Karver S., Reich R. & Quinn G. (2013). Therapy choices and quality of life in young breast cancer survivors: a short-term follow-up. *The American Journal of Surgery* 206:625-631.
- Ljungman L., Ahlgren J., Petersson L., Flynn K., Weinfurt K., Gorman J., Wettergren L. & Lampic C. (2018). Sexual dysfunction and reproductive concerns in young women with breast cancer: Type, prevalence, and predictors of problems. *Psycho-Oncology Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 27:2770-2777.
- Olsson M., Nilsson M., Fugl-Meyer K., Petersson L., Wennman-Larsen A., Kjølgaard L. & Alexanderson K. (2017). Life satisfaction of women of working age shortly after breast cancer surgery. *Quality of Life Research* 26:673-684.
- Reese J., Beach M., Smith K., Bantug E., Casale K., Porter L., Bober S., Tulskey J., Daly M. & Lepore S. (2017). Effective Patient-Provider Communication about Sexual Concerns in Breast Cancer: A Qualitative Study. *Supportive Care in Cancer* 25:3199-3207.
- Rosenberg A., Bona K., Ketterl T., Wharton C., Wolfe J. & Baker K. (2017). Intimacy, Substance Use, and Communication Needs During Cancer Therapy: A Report From the "Resilience in Adolescents and Young Adults" Study. *Journal of Adolescent Health* 60:93-99.
- Stabile C., Goldfarb S., Baser R., Goldfrank D., Abu-Rustum N., Bakarat R., Dickler M. & Carter J. (2017). Sexual Health Needs and Educational

- Intervention Preferences for Women with Cancer. *Breast Cancer Research and Treatment* 165:77-84.
- Surbeck W., Herbet G. & Duffau H. (2015). Sexuality after surgery for diffuse low-grade glioma. *Neuro-Oncology* 17:574-579.
- Tal R. & Mulhall J. (2006). Sexual Health Issues in Men With Cancer. *Oncology* 20:294-300.
- Tuinman M., Hoekstra H., Vidrine D., Gritz E., Sleijfer D., Fleer J. & Hoekstra-Weebers J. (2010). Sexual function, depressive symptoms and marital status in nonseminoma testicular cancer patients: a longitudinal study. *Psycho-Oncology Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 19:238-247.
- Ussher J., Perz J., Gilbert E. & The Australian Cancer and Sexuality Study Team. (2015). Perceived causes and consequences of sexual changes after cancer for women and men: a mixed method study. *BMC Cancer* 15:268.
- Wettergren L., Kent E., Mitchell S., Zebrack B., Lynch C., Rubenstein M., Keegan T., Wu X., Parsons H., Smith A. & AYA HOPE study Collaborative Group. (2017). Cancer negatively impacts on sexual function in adolescents and young adults: The AYA HOPE study. *Psycho-Oncology Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 26:1632-1639.
- Wiklander M., Strandquist J., Obol C., Eriksson L., Winterling J., Rodriguez-Wallberg K., Fugl-Meyer K., Ahlgren J., Ljungman P., Lampic C. & Wettergren L. (2017). Feasibility of self-help web-based intervention targeting young cancer patients with sexual problems and fertility distress. *Supportive Care in Cancer* 25:3675-3682.