Female Sexual Dysfunction and Body Image Dissatisfaction among patients with Breast Cancer

Review Articles

Ibrahim Mohamed Talaat[1], Eman Mohamed shourab[2], Mahmoud Hassan Morsy[3], Ehab Hassan Elbaz[4]

Departments of Psychiatry, Faculty of Medicine, [1,2,3]Armed Forces Collage of Medicine, [4]Military Medical Academy, Cairo, Egypt.

ABSTRACT

Background: Despite the widespread nature of female sexual dysfunction as a health issue, data on its global incidence is still sparse. Following therapy for breast cancer, disruption in female sexuality is a typical consequence that affects patients. This article's purpose was to evaluate Sexual disfunction in women In the context of breast cancer patients and to assess body image dissatisfaction among them.

Conclusion: Low FSFI scores and a high prevalence of sexual dysfunction were observed in breast cancer patients' female partners. It was shown that breast cancer survivors treated with non-hormone therapy had the highest rates of sexual dysfunction than those treated with hormonal therapy. Females with sexual dysfunctions had significant dissatisfaction with their body shape and were significantly older. Clinicians may use these statistics as a guidance for counseling sexually active breast cancer patients during the treatment planning and survival phases of their care. The evaluation of female sexual dysfunction is of great relevance.

Key Words: Body image, breast cancer, female sexual dysfunction.

Received: 11 June 2023, **Accepted:** 10 November 2023

Corresponding Author: Ibrahim Mohamed Talaat, MSc, Departments of Psychiatry, Faculty of Medicine, Armed Forces Collage of Medicine, Cairo, Egypt. **Tel.:** 0504696767, **E-mail**: ibrahimtalaat159@gmail.com

ISSN: 2812-5509, 2023, Vol. 1, No. 1

INTRODUCTION

There is no other part of a woman's body more closely linked to her femininity, parental role, and sexuality than the breast[1]. A high number of people who have survived breast cancer experience sexual morbidity (disrupted sexual function, body dissatisfaction, and sexual anguish)[2]. Sexual morbidity manifests itself in a variety of ways, including body dissatisfaction, issues with sexual function (pain, orgasm, arousal, and desire), increased sexual anguish, and body change stress (traumatic-like suffering related to changes in one's physical appearance as a result of treatment)[3]. Cancer patients experiencing these negative consequences may have more emotional anguish, sadness, and severe symptoms[4]. On the other hand, researchers have paid less attention to implications of breast cancer treatment for sexual health over the long run than they have to other bio-psycho-social aspects of the disease. Patients undergoing particular types of cancer treatments might have a significantly increased likelihood of obtaining sexually transmitted diseases.Women who have a mastectomy, even if it is followed by reconstruction, are statistically at increased probability of a reduce in sexual desire and an raise in perceptions of physical unattractiveness than those who had a breast-conserving operation[5]. In the breast cancer community, being overweight or gaining weight is associated with higher rates of depression, worse levels of body satisfaction, and lower levels of self-esteem[6]. Moreover, premenopausal women who undergo chemotherapy have an increased risk of experiencing chemotherapy-induced menopause (i.e., premature menopause), which is characterized by significant decreases in estrogen and a loss of sexual desire[7]. Lastly, we want to see how various types of breast cancer treatment (surgery, chemotherapy, radiation, and hormonal) affect breast cancer patients' sexual lives and body image satisfaction. Given these issues, it is crucial to learn more about the causes and risk factors of sexual morbidity, with a focus on how uncomfortable these conditions may be

BIO-PSYCHO-SOCIAL ASPECTS OF FEMALE SEXUALITY

Female sexual health is a fundamental component of total psychological and physical health. A healthy sense of sexuality can deliver several benefits, including: procreation; pleasure and physical release; a way of communication with the partner; enhanced spirit of self-worth; as well as a contribution to self-identity[8].

In addition to the traditional sexual health definition as the absence of sexually-related discomfort, illness, or disability, sexual health is now generally recognized

DOI: 10.21608/ARCMED.2023.212416.1030

as a positive health status that involves the combined maintenance of physical, psychological, and social wellbeing. New evidence also indicates that sexual health is an important part of overall wellness. Sexual well-being is a complicated and comprehensive notion; its influence extends to several facets of women's life[9].

Body image and sexuality: Body image and sexuality are two areas where the impacts of BC treatment are particularly noticeable. The link between treatment type and body image and sexuality, on the other hand, is inconsistent[10].

For as long as there have been breasts, they have represented femininity. Fear of losing the prosthesis and anxiety of being startled naked in the toilet are just two examples of how the lack of a breast and the resulting asymmetry may have a significant impact on a person's everyday life.

Several longitudinal studies have looked at body image and sexuality shifts over time by surgical procedure in an effort to address this discrepancy[11].

Body image and psychosexual adjustment were found to be predicted by the kind of surgery in the immediate future, but not in the distant future. According to the findings of these prospective investigations, patients' opinions of body image and sexuality improve gradually over the course of a year after surgery. This, however, may not apply to all patients[12].

Religious aspect of female sexuality

Sexual messages are regularly disseminated by religious institutions and authorities, which may influence how individuals view themselves sexually[13].

As a result of the wide disparity in religious teachings regarding sexuality and intimacy, individuals' sexual self-perceptions will differ according to their upbringing and current religious affiliation. It is believed that the level of religious engagement has a particularly negative impact on women's sexuality[14].

IMPACT OF CANCER BREAST ON FEMALE SEXUAL FUNCTIONS & BODY IMAGE

In 2020, 2.3 million women over the world were identified as having breast cancer, and 685000 succumbed to the disease. In the five years leading up to 2020, breast cancer will affect 7.8 million women this year, making it the disease most prevalent in females everywhere.[15]

Breast malignancy is the leading cause of death for females in Egypt, accounting for 38.8percent of all malignancies in this demographic, with an expected number of almost 22,700 cases in 2020 and a predicted number of over 46,000 cases in 2050. The estimated breast cancer mortality rate is around 11persent, making it 2ry only to liver cancer as a main cause of mortality from the disease[16].

The prevalence of sexual issues among breast cancer patients ranges from 30% to 100%. Similarly high rates of sexual issues are also seen by women with other forms of cancer[17].

As an illustration, between 18 and some form of sexual dysfunction is reported by 59% of women with early-stage breast cancer. It is important to note that sexual dysfunction can become chronic and last for a number of years following cancer treatment; similarly, sexual health concerns generally manifest as late effects of therapy, with major repercussions for women's sexual health during recovery and survival.[18]

Impacts of cancer and its treatment on sexual health

Cancer and its therapies impact sexual health through a range of interacting biopsychosocial routes. In cancer-treated women, it is typical for sexual function to be hampered by factors such as sexual desire, lubrication, arousal, orgasm, and discomfort and are accompanied by intense pain[19].

Cancer symptoms, drug side effects, and emotional distress from sexual health problems can all have an impact on quality of life (QoL) at any stage of the disease. Highly widespread and a substantial cause of psychological morbidity and emotional suffering are the complex effects of cancer diagnosis and treatment[20].

The negative stigma attached to discussing the effects of cancer therapy on sexual function may exacerbate the psychological and physiological distress that patients already feel. As the person's sexual well-being is impacted by a complex web of factors, including physiological, psychological, and social aspects, the etiological origins of sexual dysfunction and sexual discomfort are complex and interrelated[21].

When sexual health problems (including vaginal atrophy, genitourinary difficulties, vaginal dryness and dyspareunia) remain long after treatment has ended, it's important to offer women a wide range of medical and psychological services to help them adjust to their new normal[22].

Scarring, pain, and numbness in the breasts are common side effects for women after undergoing a mastectomy or lumpectomy. Bilateral breast tumor resections have been linked to impaired sexual desire and orgasm after surgery. Constructive surgery did not have a significant impact on patients' perceptions of themselves or their mental health[23].

Adjuvant treatments for hormone receptor-positive breast cancer often include endocrine therapies like selective oestrogen receptor modulators (e.g. tamoxifen) or aromatase inhibitors (e.g. anastrozole), which can lead to structural and functional vaginal changes like vulvo-vaginal atrophy (VVA) and dryness[24].

Lack of sexual desire, dyspareunia, dissatisfaction with sexual life in general, and dysfunction in that area are all strongly linked to vaginal dryness. More vulvo-vaginal discomfort and dryness may be so severe that they prevent regular clinical pelvic examinations and even basic everyday activities like exercising, walking, and sitting[21].

As compared to women using tamoxifen, women taking AIs are more likely to have a severe vaginal symptoms, dyspareunia, and loss of sexual desire. The physiological mechanisms through which AIs exercise their impacts on desire remain obscure[25].

Poor sexual function is strongly associated with use of chemotherapy which is also strongly associated with sexual dysfunction such as poor or lack of desire, arousal difficulties, problems with lubrication, dyspareunia and lack of or difficulty in achieving orgasm[26].

Radiotherapy (RT) is a vital component of treatment. Nevertheless, RT can cause locoregional difficulties such chronic breast pain, lack of flexibility, lymphedema, arm and shoulder pain and skin Ulcers, all of which are linked to diminished sexual performance. Radiation treatment is linked to tiredness and body image disturbances. The physical side effects of radiation therapy for breast cancer are common and severe, and they significantly decrease sexual performance in women receiving the treatment. Importantly, detrimental effects of RT tend to continue for a number of years following therapy[27].

A recent assessment of nearly 600 patients who underwent implant breast reconstruction, 219 of whom received prior radiation therapy, found that those who had radiation therapy reported lower levels of satisfaction and a lower quality of life in regards to their health than those who did not undergo radiation therapy. Among these shortcomings were lower rankings in sexual health and breast contentment[28].

Significant improvements in vaginal dryness were demonstrated via both subjective and objective measures (such as the Visual Analogue Scale for vaginal symptoms and pH level) in a randomized controlled trial comparing the efficacy of 10 applications of a hyaluronic acid-based vaginal gel (Hyalofemme) versus an estriol-based cream (Ovestin) in 144 postmenopausal women with atrophic vaginitis and vaginal dryness. In addition, the effectiveness of hyaluronic acid gel at 5 grams per application was comparable to that of an estrogen-based approach at 0.5 grams per application[29].

Similar support is seen in clinical studies with polycarbophil-based vaginal moisturizers (e.g. Replens) with consistent administration. Restoring vaginal pH to pre-menopausal levels has significant implications for the health of vaginal tissues and microflora, and clinical trials show that consistent application of Replens (2.5 g, 3 times per week) can improve patient-reported symptom severity (e.g., decreased dryness, soreness, irritation, and dyspareunia)[30].

Recent findings indicating that it is crucial to develop a more in-depth description of the nature and incidence of psychological distress, and more specifically sexual distress, among cancer patients and survivors due to the pervasive effects of distress on overall quality of life and well-being.[31]

Health in relationships appears to be a more reliable predictor of sexual function for women undergoing cancer treatment than physical or chemical harm to the body. In the physiological processes of arousal-lubrication- orgasm and satisfaction, the quality of the connection appears to be a crucial role in influencing BC patients' sexual function[32].

Management of sexual dysfunction among females with breast cancer

Mind-body and psychosocial therapies:

Female sexual health is inextricably related to psychological processes; therefore, it is necessary that treatment programs incorporate psychosocial and mind-body therapies. Empirical evidence of the efficacy of psychosocial and mind-body therapies to improve many aspects of sexual function continues to grow, despite the fact that more randomized controlled trials (RCTs) are needed to define their particular features[33].

Psychoeducation:

Those with poor sexual arousal in oncology patients (n = 22) have been found to benefit greatly from a psychoeducational intervention that combines Measures of sexual desire, arousal, satisfaction, distress, depression, and well-being were all affected by psychosexual education, arousal training, and mindfulness. There is intriguing evidence that yoga and mindfulness- based programs improve sexual function[34].

Non-hormonal vaginal lubricants:

Widespread use of non-hormonal vaginal moisturizers for the treatment of VVA symptoms in female cancer patients. Vaginal moisturizers are more widely used than estrogen-based therapy for the treatment of vaginal tissue health, vaginal pH, microflora profiles, and VVA symptoms as irritation, discomfort, itching, dryness, and dyspareunia[22].

Some studies have found that vaginal moisturizers are just as effective as estrogen-based therapies for improving vaginal health, quality of life, and sexual function, and many more have found that they have even greater effects[22].

Estrogen-based topical (vaginal) therapies

Local application of topical estrogen is the gold standard therapy for VVA (as opposed to only treating dryness) in the general population. A rise in lactobacillus bacteria levels is indicative of the successful re-colonization of healthy vaginal flora following local estrogen treatment, which is thought with the goal of reestablishing normal vaginal pH and vaginal tissue health and pliability[35].

The general guideline is to provide low-dose, short-term local estrogen therapy for the shortest time feasible. Females with severe atrophic vaginitis as a result of tamoxifen therapy may benefit from this approach. A study of 18 Postmenopausal women with a breast cancer history, some of whom were undergoing adjuvant endocrine therapy, revealed substantial subjective and objective beneficial benefits of avaginal estrogen treatment for 12 weeks regimen on symptoms of VVA[36].

Lubricants: To alleviate discomfort, irritation, and the potential for mucosal tears brought on by insufficient natural vaginal lubrication while engaging in sexual activity or while undergoing clinical internal examinations, the use of vaginal lubricants may be recommended[22].

Intravaginally administered dehydroepiandrosterone:

Dehydroepiandrosterone (DHEA) injections administered locally or intravaginally show promise as a therapy for VVA and genitourinary syndrome, with little effects on blood steroid levels and a positive advantage-to-hazard analysis.[37]

Our Egyptian study:

Furthermore, we conducted a cross-sectional comparative study done on 80 female subjects who underwent different treatment modalities for breast cancer. They were separated into two groups: individuals who had clinically diagnosed breast cancer and those who had pathologically diagnosed breast cancer. Group I: female patients were diagnosed with cancer breast and having unilateral or bilateral breast surgery (radical or conserving breast Surgery) were assessed during the first year after surgery & female patients completed their course of chemotherapy and radiotherapy sessions. Group II: female patients were diagnosed with cancer breast and are receiving hormonal therapy and are not exposing to any type of other treatment modality as surgery, chemotherapy or radiotherapy. The medical oncology department at Al Maadi Military Hospital provided the study's participants, all of whom were sexually active women who had been diagnosed with breast cancer. Their ages ranged from 18 to 45 years, all patients fulfilling the inclusion criteria were offered to participate in the study.

Study procedures and tools:

After taking the ethical approval of AFCM ethical committee the following was conducted:

- All females involved in the study were subjected to:

1- Oral consent: It was obtained from them after explaining the objectives of the study. All the patients were informed that all the filled information is confidential and private.

2- All patients were evaluated by clinical assessment, personal history variables included age, employment status, income, and education level. Medical variables included years of diagnosis, treatment modality (surgery, chemotherapy, radiation and hormone/targeted therapy), type of surgery (mastectomy vs. lumpectomy), breast reconstruction (yes/no), treatment-induced menopause failure (yes/no) and treatment-induced weight gain (yes/no; kg [lb]), BMI.

Tools:

1- Arabic version of Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-I):[38,39]

SCID-I is a semi-structured interview for making the major DSM-IV Axis I diagnosis. It produces an efficient and user-friendly instrument so that the advantages of structured interviewing could be applied in clinical settings. It is administered in a single sitting. It is divided into seven diagnostic modules: Mood, Psychotic, Substance abuse, Anxiety, Somatoform, Eating and Adjustment disorder. The Arabic version used in this research was translated and used in previous Egyptian study.

2- The Arabic version of Female sexual function index:[40,41]

Is a brief questionnaire measure of sexual functioning in women. It is 19-item questionnaire, has been developed as a multidimensional self-report instrument for assessing the key dimensions of sexual function in women. It provides scores on six domains of sexual function as follows: two questions to evaluate sexual desire, four questions to evaluate arousal, four questions to evaluate lubrication, three questions to evaluate orgasm, three questions to evaluate satisfaction, and three questions to evaluate pain. Within each domain scores obtained for each question are summed up and multiplied by a constant factor giving individual domain scores, as well as total score.

The FSFI total score varies between 1.2 and 36, a score < 26.6 defines sexual dysfunction. It is not a measure of sexual experience, knowledge, attitudes, or interpersonal functioning in women. The Arabic version used in this research was a validated, reliable, and locally accepted tool for use in the assessment of female sexual disorder in the Egyptian population.

The Arabic version of Body Image Scale (BIS):[42,43]

It was designed for the assessment of body image in cancer patients, concerning impact of treatment on selfconsciousness, physical and sexual attractiveness, femininity, satisfaction with body and scars, body integrity, and avoidance behaviour scored according to the original article and it was translated to Arabic language it contains 10 items scored on four point Likert scale ranging from (not at all) to (very much). Total score ranging between 0 and 30 degrees. Women with score 0 to 10 have minimum concerns of their body image, while women with score 11 to 20 have moderate concerns of their body image, while women with score 21 to 30 have high concerns of their body image

Results of study:

All patients who received non-hormonal treatment develop sexual dysfunction which was significantly higher than those who received hormonal therapies with a substantial and statistically significant gap between the two groups in terms of the desire domain, the arousal domain, the lubrication domain, the orgasm domain, and the sexual satisfaction domain, total score of FSFI except for pain sub-score which was higher among those who had non-hormonal therapies, we revealed that those patients who had non-hormonal treatment had a significantly higher BIS score than those who had hormonal therapies. In addition, we found that most patients subjected to non-hormonal treatment had high BIS scores (75% of patients, 30 patients). on the other hand, most patients subjected to hormonal treatment (90% of patients, 36 patients) had mild BIS scores.

CONCLUSION

Although advancements in breast cancer treatment have greatly increased the survival rate and quality of life for women with the disease, these interventions are not without their own physical, sexual, and mental side effects. Breast cancer has far-reaching effects, affecting not only the patient's own identity but also his or her relationships with others .most currently available data about sexual and psychological problems in women with breast cancer focus on the population of western countries. Based on the lack of information available about this topic in the middle east countries , this study was conducted to assess female sexual dysfunction and body image dissatisfaction among Egyptian patients with breast cancer.

CONFLICT OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Avis, N.E., Crawford, S. and Manuel, J., 2004. Psychosocial problems among younger women with breast cancer. Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer, 13(5), pp.295-308.

2. Alicikus, Z.A., Gorken, I.B., Sen, R.C., Kentli, S., Kinay, M., Alanyali, H. and Harmancioglu, O., 2009. Psychosexual and body image aspects of quality of life in Turkish breast cancer patients: a comparison of breast conserving treatment and mastectomy. Tumori Journal, 95(2), pp.212-218.

3. Frierson, G.M., Thiel, D.L. and Andersen, B.L., 2006. Body change stress for women with breast cancer: the Breast-Impact of Treatment Scale. Annals of Behavioral Medicine, 32(1), pp.77-81.

4. Meyerowitz, B.E., Desmond, K.A., Rowland, J.H., Wyatt, G.E. and Ganz, P.A., 1999. Sexuality following breast cancer. Journal of Sex & Marital Therapy, 25(3), pp.237-250.

5. American Cancer Society. 2011. Breast cancer [Brochure]. Atlanta, GA: Author.

6. American Cancer Society. 2009. Breast cancer facts & figures 2009– 2010 [Brochure]. Atlanta, GA: Author.

7. Kuo, A., Layden Wiggins, D. and Dizon, D.S., 2008. Sexual dysfunction after breast cancer treatment: Common problems, diagnosis, and management. Sexuality, reproduction & menopause, 6(4), pp.17-20.

8. Nusbaum, M. and Rosenfeld, J.A., 2004. Sexual health across the lifecycle: a practical guide for clinicians. Cambridge university press. 198 p.1.

9. Satcher, D., Hook, E.W. and Coleman, E., 2015. Sexual health in America: Improving patient care and public health. Jama, 314(8), pp.765-766.

10. Munshi, A., Dutta, D., Kakkar, S., Budrukkar, A., Jalali, R., Sarin, R., Gupta, S., Parmar, V. and Badwe, R., 2010. Comparison of early quality of life in patients treated with radiotherapy following mastectomy or breast conservation therapy: a prospective study. Radiotherapy and Oncology, 97(2), pp.288-293.

11. Collins, K.K., Liu, Y., Schootman, M., Aft, R., Yan, Y., Dean, G., Eilers, M. and Jeffe, D.B., 2011. Effects of breast cancer surgery and surgical side effects on body image over time. Breast cancer research and treatment, 126(1), pp.167-176.

12. Goodman, M.P., Placik, O.J., Matlock, D.L., Simopoulos, A.F., Dalton, T.A., Veale, D. and Hardwick-Smith, S., 2016. Evaluation of body image and sexual satisfaction in women undergoing female genital plastic/cosmetic surgery. Aesthetic surgery journal, 36(9), pp.1048-1057.

13. Abbott, D.M., Harris, J.E. and Mollen, D., 2016. The impact of religious commitment on women's sexual self-esteem. Sexuality & Culture, 20(4), pp.1063-1082.

14. Ramberg, L., 2014. Given to the goddess: South Indian devadasis and the sexuality of religion. Duke University Press.

15. Harbeck, N., Penault-Llorca, F., Cortes, J., Gnant, M., Houssami, N., Poortmans, P., Ruddy, K., Tsang, J. and Cardoso, F., 2019. Breast cancer. Nature reviews Disease primers, 5(1), pp.1-31.

16. Ibrahim, A.S., Khaled, H.M., Mikhail, N.N., Baraka, H. and Kamel, H., 2014. Cancer incidence in Egypt: results of the national population-based cancer registry program. Journal of cancer epidemiology, 2014.

17. Desimone, L.M., Hochberg, E.D., Porter, A.C., Polikoff, M.S., Schwartz, R. and Johnson, L.J., 2014. Formal and informal mentoring: complementary, compensatory, or consistent?. Journal of Teacher Education, 65(2), pp.88-110.

18. Bober, S.L., Reese, J.B., Barbera, L., Bradford, A., Carpenter, K.M., Goldfarb, S. and Carter, J., 2016. How to ask and what to do: a guide for clinical inquiry and intervention regarding female sexual health after cancer. Current opinion in supportive and palliative care, 10(1), p.44

19. Denlinger, C.S., Carlson, R.W., Are, M., Baker, K.S., Davis, E., Edge, S.B., Friedman, D.L., Goldman, M., Jones, L., King, A. and Kvale, E., 2014. Survivorship: sexual dysfunction (female), version 1.2013. Journal of the National Comprehensive Cancer Network, 12(2), pp.184-192.

20. Wittmann, D., 2016. Emotional and sexual health in cancer: partner and relationship issues. Current Opinion in Supportive and Palliative Care, 10(1), pp.75-80.

21. Boquiren, V.M., Esplen, M.J., Wong, J., Toner, B., Warner, E. and Malik, N., 2016. Sexual functioning in breast cancer survivors experiencing body image disturbance. Psycho-Oncology, 25(1), pp.66-76.

22. Huffman, L.B., Hartenbach, E.M., Carter, J., Rash, J.K. and Kushner, D.M., 2016. Maintaining sexual health throughout gynecologic cancer survivorship: A comprehensive review and clinical guide. Gynecologic oncology, 140(2), pp.359-368.

23. Surbeck, W., Herbet, G. and Duffau, H., 2015. Sexuality after surgery for diffuse low-grade glioma. Neuro-oncology, 17(4), pp.574-579.

24. DeSimone, M., Spriggs, E., Gass, J.S., Carson, S.A., Krychman, M.L. and Dizon, D.S., 2014. Sexual dysfunction in female cancer survivors. American journal of clinical oncology, 37(1), pp.101- 106.

25. Colleoni, M. and Munzone, E., 2015. Picking the optimal endocrine adjuvant treatment for pre-menopausal women. The Breast, 24, pp.S11-S14.

26. Ganz, P.A., Cecchini, R.S., Julian, T.B., Margolese, R.G., Costantino, J.P., Vallow, L.A., Albain, K.S., Whitworth, P.W., Cianfrocca, M.E., Brufsky, A.M. and Gross, H.M., 2016. Patient-reported outcomes with anastrozole versus tamoxifen for postmenopausal patients with ductal carcinoma in situ treated with lumpectomy plus radiotherapy (NSABP B-35): a randomised, double-blind, phase 3 clinical trial. The Lancet, 387(10021), pp.857-865.

27. Sunesen, K.G., Nørgaard, M., Lundby, L., Havsteen, H., Buntzen, S., Thorlacius-Ussing, O. and Laurberg, S., 2015. Long-term anorectal, urinary and sexual dysfunction causing distress after radiotherapy for anal cancer: a Danish multicentre cross-sectional questionnaire study. Colorectal Disease, 17(11), pp.O230-O239.

28. Bennett, M.L., Bennett, F.C., Liddelow, S.A., Ajami, B., Zamanian, J.L., Fernhoff, N.B., Mulinyawe, S.B., Bohlen, C.J., Adil, A., Tucker, A. and Weissman, I.L., 2016. New tools for studying microglia in the mouse and human CNS. Proceedings of the National Academy of Sciences, 113(12), pp.E1738-E1746.

29. Chen, J., Geng, L., Song, X., Li, H., Giordan, N., & Liao, Q. (2013). Evaluation of the Efficacy and Safety of Hyaluronic Acid Vaginal Gel to Ease Vaginal Dryness: A Multicenter, Randomized, Controlled, Open-Label, Parallel-Group, Clinical Trial. The Journal of Sexual Medicine, 10(6), 1575–1584

30. Sinha, A. and Ewies, A.A.A., 2013. Non-hormonal topical treatment of vulvovaginal atrophy: an up-to-date overview. Climacteric, 16(3), pp.305-312.

31. Philip, E.J., Nelson, C., Temple, L., Carter, J., Schover, L., Jennings, S., Jandorf, L., Starr, T., Baser, R. and DuHamel, K., 2013. Psychological correlates of sexual dysfunction in female rectal and anal cancer survivors: analysis of baseline intervention data. The journal of sexual medicine, 10(10), pp.2539-2548.

32. Boswell, E.N. and Dizon, D.S., 2015. Breast cancer and sexual function. Translational andrology and urology, 4(2), p.160.

33. DuHamel, K., Schuler, T., Nelson, C., Philip, E., Temple, L., Schover, L., Baser, R.E., Starr, T.D., Cannon, K., Jennings, S. and Jandorf, L., 2016. The sexual health of female rectal and anal cancer survivors: results of a pilot randomized psycho-educational intervention trial. Journal of Cancer Survivorship, 10(3), pp.553-563.

34. Brotto, L.A., Smith, K.B., Breckon, E. and Plante, M., 2013. Pilot study of radical hysterectomy versus radical trachelectomy on sexual distress. Journal of Sex & Marital Therapy, 39(6), pp.510- 525.

35. Athanasiou, S., Pitsouni, E., Antonopoulou, S., Zacharakis, D., Salvatore, S., Falagas, M.E. and Grigoriadis, T., 2016. The effect of microablative fractional CO2 laser on vaginal flora of postmenopausal women. Climacteric, 19(5), pp.512-518.

36. Biglia, N., Peano, E., Sgandurra, P., Moggio, G., Panuccio, E., Migliardi, M., Ravarino, N., Ponzone, R. and Sismondi, P., 2010. Low-dose vaginal estrogens or vaginal moisturizer in breast cancer survivors with urogenital atrophy: a preliminary study. Gynecological Endocrinology, 26(6), pp.404-412.

37. Bouchard, C., Labrie, F., Derogatis, L., Girard, G., Ayotte, N., Gallagher, J., Cusan, L., Archer, D.F., Portman, D., Lavoie, L. and Beauregard, A., 2016. Effect of intravaginal dehydroepiandrosterone (DHEA) on the female sexual function in postmenopausal women: ERC-230 open-label study. Hormone Molecular Biology and Clinical Investigation, 25(3), pp.181-190.

38. First, M.B., 1997. Structured clinical interview for DSM-IV axis I disorders. Biometrics Research Department.

39. El Missiry, A., Sorour, A., Sadek, A., Fahy, T., Abdel Mawgoud, M. and Asaad, T., 2003. Homicide and psychiatric illness: an Egyptian study [MD thesis]. Cairo: Faculty of Medicine, Ain Shams University.

40. Rosen, C. Brown, J. Heiman, S. Leiblum, C. Meston, R. Shabsigh, D. Ferguson, R. D'Agostino, R., 2000. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. Journal of sex & marital therapy, 26(2), pp.191-208.

41. Anis, T.H., Gheit, S.A., Saied, H.S. and Al_kherbash, S.A., 2011. Arabic translation of Female Sexual Function Index and validation in an Egyptian population. The journal of sexual medicine, 8(12), pp.3370-3378.

42. Hopwood, P., 1993. The assessment of body image in cancer patients. European Journal of Cancer, 29(2), pp.276-281.

43. Gamal, S. Body image, self –esteem and quality of sexual life after mastectomy. Mansoura nursing Journal. 2015.