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Masters Program in Public Health, Universitas Sebelas Maret

Meta-Analysis

Meta Analysis of the Effect of Mastectomy on Dysfunction Sexuality in Women with Breast Cancer

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ABSTRACT

Background: Breast cancer is cancer that forms in breast tissue, breast cancer occurs when cells in the tissue in the breast grow uncontrollably and take over the healthy breast tissue and its surroundings. Breast cancer has the highest mortality rate due to delay in early detection. In addition, several breast cancer treatments such as lumpectomy surgery, mastectomy, radiotherapy, hormone therapy and chemotherapy have long-term side effects, one of which is sexual dysfunction. This study aimed to estimate the effect of mastectomy on sexual dysfunction in women with breast cancer, with a meta-analysis of primary studies conducted by the previous authors.
Subjects and Method: This study was a systematic review and meta-analysis with the following PICO, population: women with breast cancer. Intervention: mastectomy. Comparison: no mastectomy. Outcome: sexual dysfunction. The articles used in this study were obtained from databases, namely Google Scholar, PubMed, and Science Direct. Keywords to search for articles "Breast Cancer" OR "Sexual Dysfunction" OR "Mastectomy" articles included are full-text English and Indonesian with a cross-sectional study design from 2012 to 2021 and report the Adjusted Odds Ratio (aOR) that appropriate in the multivariate analysis. The selection of articles was carried out using the PRISMA flowchart. Articles were analyzed using the Review Manager 5.3 aplikasi application.
Results: A total of 9 cross-sectional studies involving 6,045 breast cancer patients from Spain, China, Turkey, Denmark, America, UAS, Iran, Australia, and Iran were selected for systematic review and meta-analysis. The data collected showed that breast cancer patients who underwent mastectomy had a 1.69 times risk of sexual dysfunction compared to women who did not use the mastectomy treatment method (aOR = 1.69; 95% CI = 0.83 to 3.45: p < 0.001).
Conclusion: Women with breast cancer and undergoing mastectomy increase the risk of sexual dysfunction.

Keywords: breast cancer, mastectomy, sexual dysfunction.

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BACKGROUND

Cancer is one of the non-communicable diseases that is a burden on health throughout the world. Cancer is a disease characterrized by the presence of abnormal cells that can grow uncontrollably and have the ability to invade and move between cells and body tissues. The World Health Organization mentions cancer as one of the lead-

ing causes of death worldwide (Infodatin, 2019).

One of the most common types of cancer in women is breast cancer. Breast cancer is a type of cancer that has the highest contribution to the prevalence of cancer in women in Indonesia. Breast cancer has the highest mortality rate due to delay in early detection. The results of early detection of breast cancer in 2020 found 26,550 lumps and 4,685 suspected breast cancer (Kemenkes RI, 2020).

Technological developments in the medical world have found several methods of breast cancer treatment, one of which is mastectomy. Mastectomy is most often taken because it has the greatest cure rate. Mastectomy is a surgical removal of the affected breast cancer, can be done at stage II and III. Mastectomy can inhibit the process of cancer cell development and generally has a cure rate of 85% to 87%, but the patient will lose some to all of the breast (Guntari, 2016).

Breast cancer surgery with mastectomy has unwanted effects. In addition to pain after surgery and changes in breast shape, side effects that may occur from a mastectomy are wound due to infection, formation of blood in the wound, formation of clear fluid in the wound. if the axillary lymph nodes are removed, another possible side effect is swelling of the arms and chest. In addition, the emotional effects of post-cancer treatment can interfere with sexual attraction and feelings. Sadness, depression and worry about change, stress related to partners, and reduced self-confidence (Chirani and Mirzaian, 2016).

Another problem faced by women with post-mastectomy breast cancer is related to sexual dysfunction, which can occur during treatment and continue into long-term survival. In one study, it was stated that while physical and emotional function had normalized, sexual function was still impaired with reduced sexual activity with their partners and persistent vaginal dryness (Boswell and Don, 2015).

Based on this description, the researcher wanted to conduct a study with the aim of estimating the average magnitude of the effect of breast cancer on sexual dysfunction in women, with a meta-analysis of the main study conducted by previous authors.

SUBJECTS AND METHOD

1. Study Design

This research is a systematic review and meta-analysis. The articles used in this study were obtained from databases, namely Google Scholar, Pubmed, Science Direct and Elsevier. Keywords to search for articles "Mastectomy" OR "Breast Cancer" OR "Sexual Dysfunction". The selection of articles was carried out using the PRISMA flowchart. Articles were analyzed using the Review Manager 5.3 application.

2. Inclusion Criteria

The inclusion criteria of this research article were full-text articles using a cross-sectional study design, the research subjects were breast cancer patients who underwent mastectomy, the results of the study were sexual dysfunction, multivariate analysis with Adjusted Odds Ratio (aOR) to measure the estimated effect.

3. Exclusion Criteria

Exclusion criteria in this research article are articles that do not use English, statistical results are reported in the form of bivariate analysis. Articles before 2011.

4. Definition Operational of Variable

The search for articles was carried out by considering the eligibility criteria determined using the PICO model. Population: women with breast cancer. Intervention: mastectomy. Comparison: No mastectomy. Outcome: Sexual dysfunction.

Mastectomy is defined as the surgical removal of the breast. Removal of a small amount, the entire breast up to the removal of the entire breast along with the underlying muscles and axillary lymph nodes.

Breast cancer is defined as a malignant disease that mostly affects women. This is due to the irregular division of the body's cells so that the cells cannot be controlled and will grow into lumps or often referred to as tumors or cancer.

Sexual dysfunction is defined as problems in arousal, desire, lubrication, orgasm, pain and satisfaction. The most common sexual problems after breast cancer are lack of desire, vaginal dryness, difficulty orgasming and pain during sexual intercourse.

5. Study Instruments

The research is guided by the PRISMA flow diagram and the assessment of the quality of research articles using the Assessment of study quality tool published by the Center for Evidence-Based Management (CEBMa) (CEBM, 2022).

6. Data Analysis

The collected articles are processed using the Review Manager application (RevMan 5.3). Data processing is carried out by calculating the effects and heterogeneity values to determine the combined research model and form the final results of the meta-analysis in the form of forest plots and funnel plots.

RESULTS

The article search process is carried out through several journal databases, including Google Scholar, Pubmed and Science Direct. The review process for related articles can be seen in the PRISMA flowchart in figure 1. Research related to the effect of mastectomy on sexual dysfunction in women with breast cancer consists of 9 articles from the initial search process of 1746 articles, after the deletion process of published articles with 48 of them meeting the requirements for review. more full text. A total of 9 articles that met the quality assessment were included in the quantitative synthesis using meta-analysis.

Based on the results of the forest plot analysis, it can be seen that from 9 articles it was found that mastectomy had an effect on sexual dysfunction in women. The results of the meta-analysis of this study were heterogeneous (I^2= 91%), thus the data analysis used in the forest plot was a random effect model. From the forest plot data, it was found that the mastectomy treatment method could increase the risk of sexual dysfunction by 1.69 times higher than women who did not use the mastectomy treatment method and was statistically significant (aOR = 1.69; 95% CI = 0.83 to 3.45: $p<0.001$.

Based on the results of the funnel plot images, it was found that there was a bias in the publication because the distribution of the plots in the images was not symmetrical. On the left there are 6 plots with standard error values of 0.0 to 0.6. On the right there are 3 plots with standard error values of 0.6 to 0.8.

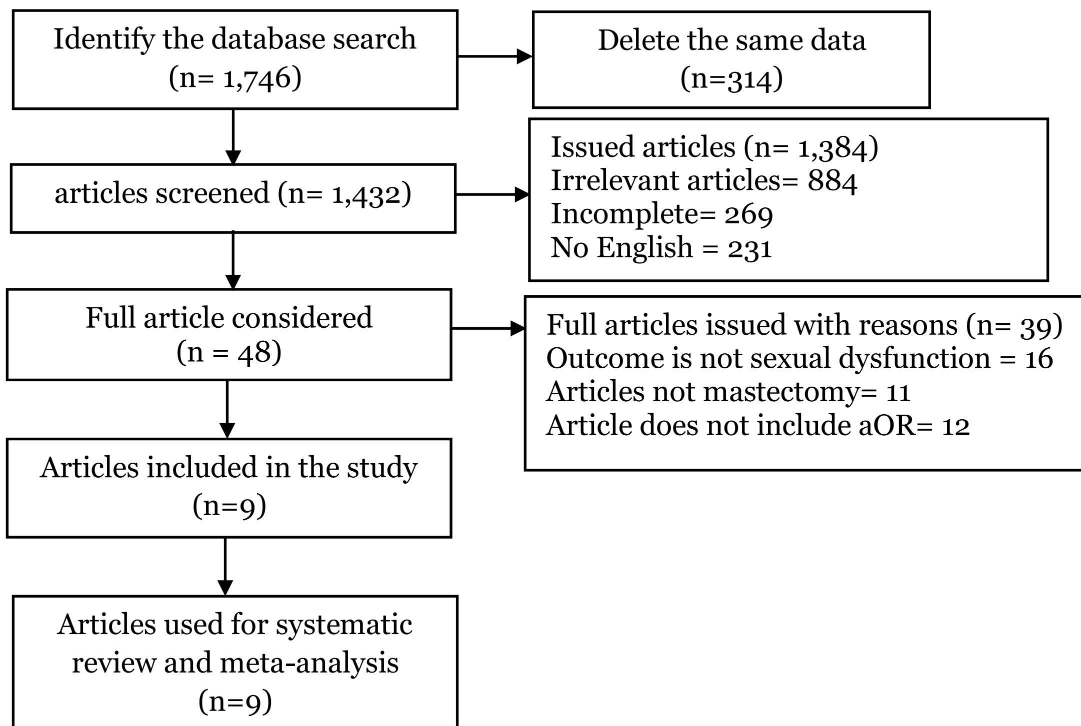

Figure 1 PRISMA Flowchart

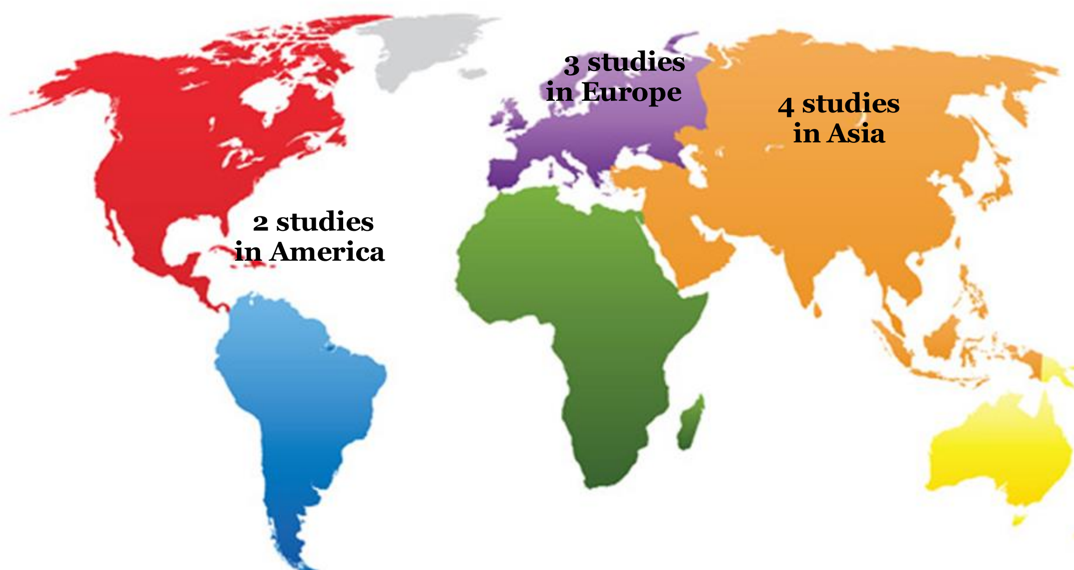

Figure 2. Research area

Table 1. Assessment of study quality published by the Center for Evidance-Based Management (CEBMa)

No.	Indicators	Publication (Author and Year)				
		Isabel et al. (2018)	Aiying et al. (2021)	Oztruk dan Okyulcu (2018)	Tucker et al. (2018)	Harrichi et al. (2018)
1	Does the study address clearly focused questions/problems?	2	2	2	2	2
2	Is the research method (study design) appropriate to answer the research question?	2	2	2	2	2
3	Is the subject selection method clearly described?	2	2	2	2	2
4	Can the manner in which the sample is obtained cause selection bias?	2	2	2	2	2
5	Is the sample of subjects representative of the study population?	2	2	2	2	2
6	Was the sample size based on pre-study considerations of statistical power?	2	2	2	2	2
7	Was the response satisfaction level achieved?	2	2	2	2	2
8	Is the measurement (questionnaire) possible to be valid and reliable?	2	2	2	2	2
9	Was statistical significance assessed?	2	2	2	2	2
10	Is there a confidence interval for the main outcome?	2	2	2	2	2
11	Could there be confounding factors that have not been taken into account?	2	2	2	2	2
12	Can the research results be applied to your organization?	2	2	2	2	2
	Total	**24**	**24**	**24**	**24**	**24**

Note: 2= Yes; 1= Can't tell; 0= No

Table 2. Cont.

No.	Indicators	Publication (Author and Year)			
		Gandhi (2019)	Foght (2020)	Lashani (2020)	Connors (2016)
1	Does the study address clearly focused questions/problems?	2	2	2	2
2	Is the research method (study design) appropriate to answer the research question?	2	2	2	2
3	Is the subject selection method clearly described?	2	2	2	2
4	Can the manner in which the sample is obtained cause selection bias?	2	2	2	2
5	Is the sample of subjects representative of the study population?	2	2	2	2
6	Was the sample size based on pre-study considerations of statistical power?	2	2	2	2
7	Was the response satisfaction level achieved?	2	2	2	2
8	Is the measurement (questionnaire) possible to be valid and reliable?	2	2	2	2
9	Was statistical significance assessed?	2	2	2	2
10	Is there a confidence interval for the main outcome?	2	2	2	2
11	Could there be confounding factors that have not been taken into account?	2	2	2	2
12	Can the research results be applied to your organization?	2	2	2	2
	Total	**24**	**24**	**24**	**24**

Note: 2= Yes; 1= Can't tell; 0= No

Table 3. Description of the primary studies included in the meta-analysis

Author (Year)	Country	Study Design	Sample Size		P (Population)	I (Intervention)	C (Comparison)	O (Outcome)	aOR (95%CI)
			Total	Mastec-tomy					
Isabel et al. (2018)	Spain	Cross-sectional	514	214	Patients with mastectomy aged 21-66 years	Mastectomy	No mastectomy	Sexual dysfunction	1.6 (0.84 to 3.13)
Aiying et al. (2021)	China	Cross-sectional	201	150	Patients with mastectomy	Mastectomy	No mastectomy	Sexual dysfunction	6.8 (1.8 to 24.9)
Ozturk dan Akyolcu (2016)	Turkey	Cross-sectional	100	43	Patients with mastectomy	Mastectomy	No mastectomy	Sexual dysfunction	29.1 (6.8 to 123.4)
Tucker et al. (2016)	Australia	Cross-sectional	119	60	Patients with mastectomy aged 33-69 years	Mastectomy	No mastectomy	Sexual dysfunction	5.6 (1.19 to 26.4)
Haricchi et al. (2012)	Iran	Cross-sectional	277	156	Patients with mastectomy less than 40 and over 56 years	Mastectomy	No mastectomy	Sexual dysfunction	1.07 (0.36 to 3.22)
Gandhi (2019)	America	Cross-sectional	272	182	Woman with mastectomy	Mastectomy	No mastectomy	Sexual dysfunction	1.1 (0.7 to 1.6)
Foght et al. (2020)	Denmark	Cross-sectional	227	79	Women with mastectomy of childbearing age up to 58 years	Mastectomy	No mastectomy	Sexual dysfunction	0.95 (0.55 to 1.65)
Lashani et al. (2020)	Iranian	Cross-sectional	181	125	Woman with mastectomy	Mastectomy	No mastectomy	Sexual dysfunction	0.77 (0.26 to 2.31)
Connors et al. (2016)	USA	Cross-sectional	4154	3243	Patients with mastectomy, childbearing age up to 55 years	Mastectomy	No mastectomy	Sexual dysfunction	0.37 (0.30 to 046)

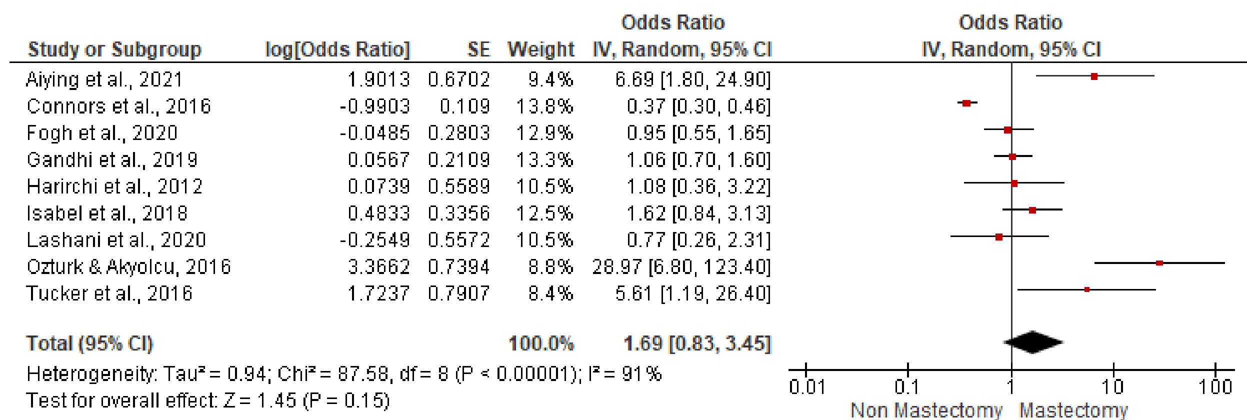

Figure 3. Forest Plot

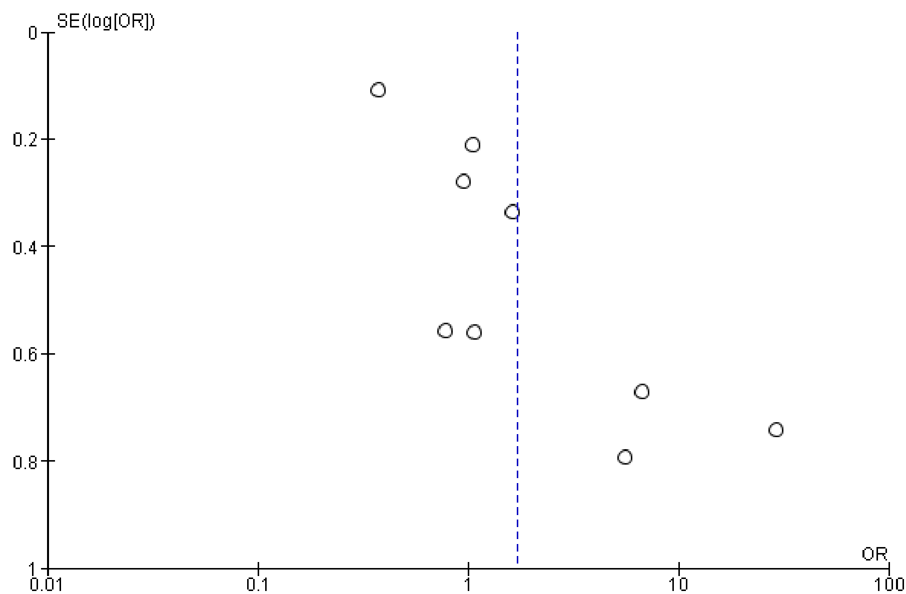

Figure 4. Funnel Plot

DISCUSSION

Breast cancer treatment requires surgery on the breast and armpit, which can lead to long-term problems both physically and mentally. Based on the results of a study conducted on women with early-stage breast cancer showed that post-operative sexual function was worse than pre-surgery. Patients who undergo mastectomy experience sexual dysfunction such as decreesed desire, decreased arousal, and difficulty orgasming (Boswell and Dizon, 2015).

Based on the results of another study, it was stated that women who had breast cancer then treated with the mastectomy method within 6-12 months after surgery had significantly impaired sexual relations (Aerts et al., 2014). In another study (Archangelo et al. 2019) it was explained that the majority of research respondents were women who had partners. Among women without a legal partner, the frequency of impaired sexual intercourse was significantly higher in the mastectomy group compared to the reconstructive-mastectomy and control groups (p=0.04). In addition, the mastectomy method can also have an impact on women's psychology and reduce self-confidence (Archangelo et al., 2019).

Mastectomy is a method of breast cancer treatment that has a negative impact on body image. From the results of the study, it was found that there were 69.3% studies showing that mastectomy can reduce sexual function and quality of life in women (Farida et al., 2021). Other studies have shown that the decrease in sexual quality and frequency is caused by various changes after undergoing treatment, because experiencing sexual problems in the early months after the resumption of sex often results in reduced sexual effort which then results in avoidance of sex by the partner (Takahashi et al., 2008). Other studies have shown that breast cancer and its treatment can cause significant problems with sexual function in women. Patients with breast cancer who undergo therapy are more likely to complain of problems with sexual function, fatigue, and sleep disturbances (Rahmi et al., 2019).

Mastectomy in women with breast cancer is a surgical procedure to remove the entire breast tissue with the aim of curing and preventing the cancer from spreading more widely. In addition, the results of the study show that the mastectomy treatment method can cause sexual dysfunction in sufferers. Difficulty in attraction to partners, sexual interest and resulting in decreased satisfaction in sexual life. The limitations of this study are that there is a language bias because it only uses English articles, and a search bias because it only uses 3 databases.

AUTHORS CONTRIBUTION

Rizki Januar Putri and Sumiyati were the main researchers who chose the topic, searched for and collected research data. Isna Nur Rohmah analyzes data and examines research documents.

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CONFLICT OF INTEREST

There was no conflict of interest in this study.

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