

# Early menarche with breast cancer awareness: a literature review

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**Abstract**—Breast cancer is a cancer with the second highest prevalence after cervical cancer in Indonesia. The cause of high cases of breast cancer can occur because of ignorance about the triggers of the causes of breast cancer. The development and growth of the breast is influenced by the hormones estrogen and progesterone for growth. One of these hormones, namely estrogen can trigger the initial cause of cancer. It is known that the incidence of girls in Indonesia experiences menarche at less than 12 years of age, so that socialization of breast cancer prevention behaviors in conjunction with early menarche is important. This study aims to review, analyze and compare the number of articles stating the presence or absence of early menarche relationships with breast cancer in order to become a public concern that early menarche is a risk factor for breast cancer, as well as prevention efforts through risk factors for early menarche, because early menarche is one risk factors for breast cancer are factors that cannot be changed. The design used is a review literature. The results of the study, based on literature studies from the PubMed, are articles from 2015-2019 that comparing the number of articles showed that there was a relationship between early menarche and breast cancer, namely 10 out of 12 articles (83.3%), compared to those showing no relationship, namely 2 articles from 12 articles (16.6 %). In conclusion there have been many studies that suggest a relationship between early menarche and breast cancer, so early menarche can be considered as a risk factor for breast cancer and several efforts to prevent breast cancer through menarche risk factors, especially a risky lifestyle, namely excessive fat intake media exposure for adults, lack of physical activity, use of hormonal contraception by mothers, and weight.

**Keywords**—early Menarche, Breast Cancer, breast cancer Prevention

## I. INTRODUCTION

Breast cancer is a cancer in women who is the second highest after cervical cancer, with a prevalence of 0.5% in Indonesia<sup>1</sup>. Cancer arises due to abnormal growth of body tissue cells which then turn into cancer cells. As a result of abnormal growth causes the cells to be urgent and damaging and interfere with the organs occupied. The number of new cases and deaths from cancer showed a significant increase. The most cancer cases in men are lung cancer, whereas in women it is breast cancer [2].

At present the risk factors for breast cancer have not been clearly known, there are several factors, namely factors that cannot be changed and factors that can be changed (Mulyani

and Nuryani, 2013) [3] Risk factors for breast cancer that cannot be changed are important to note, because if these factors exist in a person, then this factor cannot change again, including genetic factors, age, and one of them is early menarche [3].

Based on the 2010 RISKESDAS, the average age of 13-14 years menarche occurs at 37.5 percent, while early menarche occurs in 5.2 percent of Indonesian children, this early menarche occurs in ages under 9-11 years, menarche is also found at the age of 6- 8 years, occurs in a small proportion (<0.5%) of children in 17 provinces in Indonesia 4. Menarche that is too fast enables health effects on young women, including risk factors for ovarian cancer, risk of cardiovascular disease, faster menopause, and also breast cancer 5,6. Someone who experiences early menarche, causes more exposure to the hormone estrogen and the hormone progesterone [7]. This causes cell proliferation that cannot be controlled and can develop into cancer cells, namely breast cancer [8]. This study aims to describe the relationship between early menarche and the incidence of breast cancer by reviewing, analyzing and comparing the number of articles stating the presence or absence of early menarche relationships with breast cancer in order to be of public concern that early menarche is a risk factor for breast cancer, and to elaborate several risk factors for early menarche, this is an effort to prevent breast cancer, because early menarche as one of the risk factors for breast cancer is a factor that cannot be changed.

## II. METHODS

The researcher screened 70 literature studies from the PubMed database for review. This review literature method is adjusted to the steps of Systematic Literature Review, namely 1) Identification of problems, 2) Prioritizing problems and questions, 3) Making Frameworks, 4) Literature search, 5) Choosing articles, 6) Making critical judgments, 7) Extract selected paper data, 8) Collect data and create maps to answer questions.

**Problem Identification:** Based on the background, the identification of the problem that will be used as an article review is the number of articles stating the presence or absence of early menarche relationships with breast cancer in order to become a public concern that early menarche is a risk factor for health problems, especially breast cancer, and prevention efforts breast cancer through risk factors for early

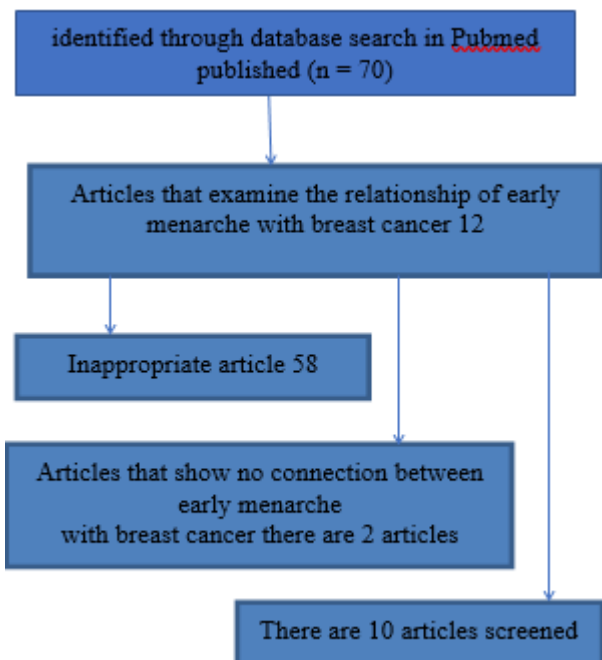
menarche, because early menarche as one of the risk factors for breast cancer is a factor that cannot be changed.

Research question: what is the comparison of the number of articles that show whether or not there is a relationship between early menarche and breast cancer? and what precautions can be taken with regard to early menarche with the occurrence of breast cancer?

This study used PEOS strategy framework. The PEOS framework applied by identify the population, exposure, results, and study design. Literature search: Literature search is based on the aim, namely to determine the relationship between early menarche and breast cancer incidence and breast cancer prevention efforts through risk factors for early menarche, then in the search for literature the two stages are divided, namely:

1) Analyze the comparison of the number of articles that show whether there is a relationship between early menarche and breast cancer

- Literature search as follows:



Thus, in the search for articles to compare the presence or absence of early menarche with breast cancer, there were 70 articles identified, after filtering titles, abstracts, research methods found 12 articles to be taken and reviewed independently based on inclusion criteria, namely articles starting in 2015- 2019 and exclusion, namely articles that are not appropriate because they do not examine early menarche as a risk factor (58 articles). Twelve articles were appropriate, after further screening to find a comparison of articles showing the absence of an association between early menarche and breast cancer, a critical assessment found 10 articles that had proven a relationship and only 2 articles showing no association between early menarche and cancer breast.

2. prevention efforts through risk factors for early menarche

The appropriate article is to review the risk factors for early menarche, by identifying articles related to risk factors for early menarche, in order to review the behavior of people at risk with early menarche as a risk factor for health problems, especially breast cancer. The results of article identification starting in 2015-2019, there are 6 articles that need to be reviewed as risk factors for early menarche.

Critical assessment: Critical assessment is used to assess the quality of articles to be used. The tool chosen to assess the quality of articles is CASP. The articles that were screened at the critical assessment stage were 10 articles that corresponded to the early menarche relationship with the incidence of breast cancer, and 8 articles that were in accordance with the risk factors for early menarche.

Mapping: Findings with systematic searches get a description that the research that describes there is a relationship between early menarche as a risk of breast cancer, originating from China, Pakistan, Mizo-Mongols, Mexico and Morocco.

### III. RESULTS

#### A. Comparison of the number of articles stating the presence or absence of early menarche relationships with breast cancer

The literature study, the results of a review of the PubMed database, compared the number of articles stating whether there was an early menarche relationship with cancer, found more articles which showed an association between early menarche and breast cancer 10 out of 12 articles (83.3%), rather than showing there is no relationship, namely 2 articles from 12 articles (16.6%), several articles that state early menarche as a risk factor, namely: 1) Liu, Y.T., (2011), with a study entitled "Physiological, reproductive risk factors and breast cancer in Jiangsu province of China", explained that. Early age at menarche is at risk for breast cancer [7]. 2) Godinez M., E., Y., et al. (2014), with a study entitled "Determination of 2-hydroxyestrone / 16 $\alpha$ -hydroxyestrone ratio in urine of Mexican women as a risk indicator for breast cancer and its relationship with other risk factors", described that early menarche and body mass index contributed 5, 4% breast cancer [9]. 3) Thapa, S., et al. (2016), with a study entitled "Mitochondrial complex I and V gene polymorphisms associated with breast cancer in mizo-mongloid population". It was described that high animal fat intake and age at menarche were found to be associated with a higher risk of breast cancer in the Mizo population [10]. 4) Suvian, S.N., et al. (2015), with a study entitled "Evaluation of Common Risk Factors for Breast Carcinoma in Females: a Hospital Based Study in Karachi, Pakistan", described that. Early age of menarche, and some others such as old age, family history of breast cancer, family history of other carcinomas, personal history of breast carcinoma, more maternal age in the first pregnancy, fewer children. Five factors, parity, breastfeeding, history of intake of oral contraceptive pills, history of oophorectomy and hysterectomy in the past showed protective relationships [11]. 5) Li, H., et al. (2017), with research entitled "BMI, reproductive factors, and molecular subtypes: A case-control study and meta-analysis". What is explained is that early menarche and nulliparity increase the risk of luminal tumors which can later lead to cancer in the breast[11]. Dall, GV, and Britt, KL, (2017) with a study entitled "Estrogen Effects on Mammary Gland in Early and Late Life and Breast

Cancer Risk", described that current epidemiological data indicate that women who are exposed to early estrogen or early menarche have significant effect on breast cancer risk and this significance is also higher when compared with late menopause who also experience a lot of estrogen exposure [12]. Khalis, M., et al., (2018), with a study entitled "Menstrual and reproductive factors and risk of breast cancer: A case-control study in the Fez region, Morocco", described early menarche (OR = 1.60, 95% CI: 1.08-2.38) and nulliparity (OR = 3.77, 95% CI: 1.98-7.30) were significantly associated with an increased risk of breast cancer [10]. Al-Ajmi, K., et al., (2018), with a study entitled "Risk of breast cancer in the UK biobank female cohort and its relationship to anthropometric and reproductive factors", described that the age of early menarche and other factors, including age, low BMI, low waist to hip ratio, nulliparous, advanced age at first live birth, and long duration of contraceptive use all significantly associated with an increased risk of breast cancer [13]. Daraei, A., et al., (2019), with a study entitled "Methylation of progesterone receptor isoform A promoter in normal breast tissue: An epigenetic link between early age at menarche and risk of breast cancer?", Described that early menarche as one of the reproductive factors at risk for breast cancer [14]

Based on this literature review, it can be described that there have been many results of research stating that there is a relationship between early menarche and breast cancer, so early menarche can be considered as a risk factor for breast cancer. As a risk factor, early menarche is a risk factor that cannot be prevented, as are other risk factors, genetics, age of advanced menopause, and a history of benign tumors, so to reduce the incidence of breast cancer with early menarche, one of the preventable methods is duration of preventing early menarche from the start. Thus, the next study of literature will be discussed in an article that discusses the relationship between lifestyle and early menarche.

#### *B. Breast cancer prevention efforts, through risk factors for early menarche*

The appropriate article to review efforts to prevent breast cancer in this review literature will be analyzed through risk factors for early menarche, because early menarche is one of the risk factors for preventable breast cancer, so that it is better for the public to prevent it before the onset of early menarche. In this regard, several articles will be related to risk factors for early menarche. The results of article identification starting in 2015-2019, there are 6 articles that need to be reviewed as risk factors for early menarche, namely: 1) Genoveva, M., D., P., (2015) with a study entitled "Consumption of Junk Food and Early Puberty", described that the consumption habits of junk food affect puberty early [15]. 2) Rummy, IZ, et al (2017), with a study entitled "Age of Menarche Associated with Nutritional Status, Food Consumption and Physical Activity", described risk factors for early menarche, namely nutritional status, fat intake, frequency of consumption of junk food and physical activity related to early menarche [16]. 3) Rizky, B., et al., (2017), with a study entitled "Factors Associated with Menarche Dini in adolescent girls in Medan 10 N. Middle School", described that behavior can be a risk factor for early menarche, namely the pattern good eating, good nutritional status, external stimuli such as pornography related to early menarche [17]. 4) Esti, Y., et al. (2017), with a study entitled "Nutritional Status Affects the Age of Menarche", it was described that the better the nutritional status of children, the

younger the age of menarche [18]. 5) Sabina, B., et al. (2018), with a study entitled "Factors Associated With Early Menarche among Adolescents Girls: A Study from Nepal", described the risk factors for early menarche in Nepalese women, namely physical activity, lack of sleep, absence of biological fathers, exposure to sexual material, inadequate breastfeeding, use of hormonal contraception by mothers, low birth, weight, exposure to chemicals during pregnancy and maternal age at menarche [19]. 6) Sarma, E.N.S., (2015) with a study entitled "Factors Associated with Menarche Status in Junior High School X in Rangkabitung", described that media exposure for influential adults was twice as influential on menarche status [20]. 7) Epplein, M., et al. (2010) with a study entitled "Association of maternal and intrauterine characteristics described that there is a significant relationship between the age of menarche in mothers and children and there is a relationship between the history of breast cancer women with an increased risk of early age at menarche [21].

Thus it can be described that efforts to prevent early menarche, namely a history of early menarche, history of mothers with breast cancer, LBW, nutritional status, and unhealthy lifestyles, such as excessive fat intake, media exposure for adults, lack of physical activity, use of hormonal contraception by the mother, and weight.

#### IV. DISCUSSION

##### *1) Comparison of the number of articles stating the presence or absence of early menarche relationships with breast cancer*

The results of the literature study have described that the number of articles stating that there is no relationship between early menarche and breast cancer is greater than the article stating that there is no relationship, early menarche can be considered as a risk factor for breast cancer. Menstrual cycles are generally experienced first by women when they are 12-15 years old. Early age of menarche which is less than twelve years causes exposure to the hormone estrogen in the body to be faster and influence the process of tissue proliferation including breast tissue [22]. If puberty occurs earlier, exposure to estrogen and progesterone in women can be a cause of tissue proliferation including breast tissue [6].

##### *2) Breast cancer prevention efforts, through risk factors for early menarche*

The literature results of Review can be explained that early menarche is associated with several preventable factors, such as an unhealthy lifestyle, namely:

###### *a) excessive fat intake and junk food*

Some experts describe that teenagers who have a lot of fat tend to experience premature menarche compared to adolescents with a good diet. Body fat affects leptin levels and estrogen production [23]. High animal protein usually increases IGF-1 levels which contribute during the puberty process [24]. The same thing in Junk food has an effect on increasing adolescent nutrition, because junk food usually contains high calories, sugar, fat content, and sodium but low content of vitamin C, fiber, calcium, folate and ascorbic acid. Increased adipose cells associated with an increase in leptin hormone which influences stimulating kisspeptin tang neurons will later bind to the GPR54 receptor, causing GnRH

to be secreted so that an increase in FSH and LH triggers menarche [25]

*b) child nutritional status and weight*

In the article, it was explained that female students who had a nutritional status of 2.42 times were at risk of experiencing early menarche, compared to students of normal nutritional status, while female students with underweight nutritional status were 0.19 times. Teenagers who are tall and have large body mass tend to experience a younger age of menarche [8].

*c) media exposure for adults*

In the article it was revealed that students who watched TV that were not good were estimated to be 2.46 times at risk of experiencing premature menarche. This is in accordance with the theory that describes watching television more than 3 hours resulting in disruption of the production of the hormone melatonin, and disruption of the release of this hormone causes the release of the hormone GNRH, so that it will be one of the causes of early menarche [8]. Stimulation of watching adult films, making an increased sexual reaction on the attachment of the FSH hormone from the pituitary, this is what causes early menarche [26].

*d) lack of physical activity*

The role of physical activity is said that physical activity that is not good is associated with the incidence of early menarche. The higher physical activity, the age of menarche will be slower. To elaborate on this, one of them is related to body mass index, a high BMI is associated with early menarche [5].

#### V. CONCLUSION

The amount of research that states there is a relationship between early menarche and breast cancer more than that which states there is no relationship, so people need to be aware of early menarche as a risk factor for breast cancer. Breast cancer prevention efforts, can be through the risk factors for early menarche that can be prevented, such as unhealthy lifestyles, namely excessive fat intake, nutritional status of children, media exposure for adults, lack of nutrition, lack of physical activity, use of hormonal contraception by mother, weight. It is recommended the importance of socialization to the community through health promotion about early menarche as a health risk, especially breast cancer and prevention efforts through risk factors for early menarche, because early menarche as one of the risk factors for breast cancer is an unavoidable factor.

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