Dietary Pattern, Sedentary Lifestyle and Awareness on Breast Cancer Among Adolescents

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ABSTRACT
Breast cancer is a threat to women's health. Female adolescents need to be vigilant. This study aimed to analyze the relationship between dietary patterns, sedentary lifestyles, and breast cancer awareness among female adolescents. A cross-sectional approach with stratified random sampling was used. The sample population included 206 female adolescents aged 15-18 from the Vocational High School in Surabaya. The data was collected using a validated self-administered questionnaire to measure breast cancer awareness, a Food Frequency Questionnaire (FFQ), and an Adolescent Sedentary Activity Questionnaire (ASAQ). The data were analyzed using Chi-square, and Spearman's Rho tests. Breast cancer awareness among female adolescents was high (67,5%). Dietary patterns were shown to be significantly associated with breast cancer awareness in female adolescents (OR=0,230; 95% CI: 0,081-0,651; p=0,007). However, no significant relationship between a sedentary lifestyle and breast cancer awareness. The respondents were aware of breast cancer. Nevertheless, they had insufficient knowledge of its risk factors, signs, and symptoms. Lack of knowledge regarding its risk factors might be a reason for this sedentary lifestyle. These findings suggest that further research is necessary to investigate over a time series.

Keywords: *Breast cancer, Dietary pattern, Sedentary lifestyle, Adolescence.*

1. INTRODUCTION

Breast cancer is the second most prevalent disease occurring in women worldwide [1], [2]. The prevalence of breast cancer has increased every year, particularly in developing countries [1], [3], [4]. However, breast cancer alertness in women is poor [5]–[8]. Some of the causes of this poor alertness in women include the lack of related knowledge, risk factors, signs and symptoms, and infrequent BSE [5], [6], [9]–[12]

Knowledge about breast cancer and its prevention in Indonesia is still insufficient, especially in rural areas [13], [14]. This occurs not only in adults but also in female adolescents [5], [15]. Adolescence is a defining phase for the future. Globalization and its influence on the lifestyle of adolescents have led to unhealthy lifestyle choices, such as an increased intake of fast food, a decreased intake of fruits and vegetables, along sedentary behaviors. Lifestyle choices have long been recognized as risk factors for non-communicable diseases such as breast cancer [16]–[22].

Global cancer observatory, a toolset up by the World Health Organization (WHO), showed an increased incidence of breast cancer from 1.7 million in 2012 to 2.1 million in 2018 [1]. A study conducted a high school in Indonesia found that 60% of female adolescents had poor breast cancer Alertness (lack of knowledge about the disease, signs and symptoms, risk factors, and BSE), 33.3% consumed fast food more than or exactly 3 times/week, consumed fruit and vegetables less than or just 3 times/week, and 100% spent more than 5 hours a day on weekdays watching or using screens (gadget, TV, and computer).

Alertness raising and preventive programs are needed to reduce the prevalence of breast cancer in women. The government in Indonesia has implemented a healthy lifestyle program with CERDIK (have regular health checks, get rid of cigarette smoke, exercise, follow a healthy diet, get adequate rest, and manage stress), BSEs, and clinical breast examinations [23]. WHO created a Global Action Plan to reduce and prevent Non-Communicable Diseases with a healthy lifestyle and physical activities based on recommendations [24], [25].

Nonetheless, these programs have just focused on women aged 20 years and above. Breast cancer Alertness is needed not only for adult women but also for women once their period starts. This study aims to analyze the relationship between dietary patterns, sedentary lifestyle, and breast cancer Alertness in female adolescents.

2. METHOD

The design of this study involved descriptive analysis using a cross-sectional approach. The sample population in this study involved female students of a Vocational High School in Surabaya. Students were included if they were (1) female adolescents aged between 15 and 18 years old and (The sample size was calculated using the equation of Slovin and the stratified random sampling method. A total of 206 female adolescents has participated after their parents provided written permission. Data collections were held in October 2019.

2.1 Measurement

We used and shared a valid and reproducible food frequency questionnaire (FFQ) to record the respondents' dietary patterns over 7 days. The FFQ contained 38 food items. The foods had been identified regarding food that is usually consumed by the adolescents in Indonesia while the frequency was defined according to the Indonesian Department of Agriculture. The 38 items identify the content of the food which contributes to increasing the risk of developing breast cancer.

The sedentary lifestyle questionnaire used Adolescent Sedentary Activity Questionnaire (ASAQ). The reliability test showed that ASAQ yielded a Cronbach alpha between 0.57-0.86. The ASAQ consists of various items, including small-screen recreation (SSR), education, travel, cultural activities, and social activities. In this study, we included 11 out of 12 activities that adolescents in Indonesia usually do.

The respondents' Alertness level was assessed using a self-structured questionnaire based on the breast cancer alertness measurement (BCAM) guide [26]. This determined their knowledge of the disease, perception of signs and symptoms, and perception during the BSE. The questionnaire had been tested on 15 female adolescents from different respondents for validity and reliability with a Cronbach alpha of 0.970. The breast cancer Alertness questionnaire consisted of 15 questions divided into five types; namely knowledge of the disease, knowledge of breast cancer risk factors, knowledge of breast cancer signs and symptoms, perception of signs and symptoms, and perception of BSE.

2.2 Procedure

The researcher came to the school the day before the students were due to fill in the questionnaire and gave the study information and distributed approval sheets for them to give their parents. Female students, who had signed informed consent forms were allowed to participate in this study. In the week that followed, the researchers came to the school to collect the data. The respondents were given information on the study aims, the benefits and risks, the principles of confidentiality, and any compensation they would receive before they completed the questionnaires. Every respondent was given a souvenir, a leaflet, and health education about breast cancer and how to prevent it. To ensure there were no double or blank forms, the researcher checked students' answers before they collected them. The researcher was helped and supported by counseling teachers in school.

2.3 Analysis

The analysis used in this study was univariate and bivariate. Univariate analysis was used to determine the respondent characteristics using a frequency distribution test for demographic data and all variables. Bivariate analysis was used to show the correlations between dependent and independent variables. Data are presented as frequencies (%). Correlations were examined with Chi-squared and Spearman's Rho tests with a significance level of 0.05. The Chi-squared test was calculated with their Confidence Intervals (CI).

3. RESULTS AND DISCUSSION

The respondent characteristics are presented in Table 1. In this study, the majority of respondents were 17 years old (44.2%), and had experienced menarche between 12 and 14 years old. The majority of respondents didn't have a family with breast cancer (93.2%). They lived with their parents (88.3%) Most of the respondents received information about breast cancer from the internet /social media (42,7%). Table 2 shows the frequencies of dietary patterns (how often the respondents eat certain foods), sedentary behaviors, and breast cancer Alertness in adolescents in Surabaya, Indonesia. The majority of female adolescents had dietary patterns that would not increase the risk of developing breast cancer (91.7%). A total of 148 adolescents reported they lead a mostly sedentary lifestyle. They were mostly aware of breast cancer (67.5%). This result was different from that of previous studies. The high level of Alertness was due to the level of knowledge about the disease (Table 3). Most female students understood that breast cancer is a severe disease; however, they had poor knowledge of risk factors and BSE.

Table 1. Respondent characteristics (n=206)

Characteristics	f	%
Age		
15	37	18
16	64	31.1
17	91	44.2
18	14	6.8
Menarche (years old)		
<12	38	18.4
12-14	167	81.1
>15	1	0.5
Family with breast cancer		
Yes	14	6.8
No	192	93.2
Lived		.
With parents	182	88.3
Boarding house	8	3.9
Family (no parent)	16	7.8
Source of Information		
Family	35	17
Friends	13	6.3
Public health	24	11.7
School	32	15.5
Internet/social media	88	42.7
TV/radio	14	6.8

f = Frequency

Table 2. Dietary pattern, sedentary lifestyle, and Alertness on breast cancer (n=206)

Characteristics	f	%
Dietary pattern		
Have no risk	189	91.7
Have risk	17	8.3
Sedentary lifestyle		
Low	3	1.5
Moderate	55	26.7
High	148	71.8
Breast cancer Alertness		
Low	67	32.5
High	139	6.,5

f = Frequency

Female adolescents who had high Alertness had dietary patterns that would not increase the risk of developing breast cancer. The Chi-squared test yielded p=0,007, meaning there was a statistically significant correlation between dietary pattern and breast cancer Alertness level in female adolescents. Female adolescents had a high Alertness level but still had a high sedentary lifestyle. Spearman's Rho test yielded p=0.548, meaning there is no correlation between a sedentary lifestyle and breast cancer Alertness among the students. Dietary patterns in female adolescents did not include foods that increase the risk of developing breast cancer. Foods that can increase the risk of breast cancer are roast meat, red meat, instant noodles, and crabs. Female adolescents ate those foods but the frequency of this did not tend to breast cancer risk.

Table 3. Breast Cancer Alertness in Female Adolescents

Category	Mean ± SD
Knowledge of breast cancer	11,29 ± 1,73
Knowledge of breast cancer signs and symptoms	4,34 ± 1,30
Knowledge of breast cancer risk factors	4,87 ± 1,36
Perception of breast cancer	9,06 ± 1,97
Perception of the ability to BSE	6,13 ± 2,12

SD = Standard Deviation

Table 4. Correlation between Dietary Pattern, Sedentary Lifestyle, and Breast Cancer Alertness

Variable	Breast cancer alertness		
	P value	OR	95% CI
Dietary pattern	0,007	0,230	0,081-0,651
Sedentary lifestyle	0,548		

Factors that could influence their dietary patterns are gender, age, peer pressure, culture, and eating habits [3], [27]–[29]. Adolescents usually like unhealthy foods, such as eating less fibrous foods and sweet foods.

Most female adolescents were from low socioeconomic status. Those from high socioeconomic status usually ate meat and high cholesterol foods. Conversely, those from low socioeconomic backgrounds preferred vegetables, fruits, and protein. In Surabaya, the monetary allowance was not enough. The consumption of sweet drinks can be influenced by school environmental factors[30]. The respondents reported they consumed sweetened drinks more frequently than sweet foods. Sweetened foods they consumed mainly included donuts, chocolate, and bread. Adolescence has a greater curiosity than others [31]. This could be a reason most adolescents snacked more often. However, the dietary patterns described in this study were only based on the type of food and the frequency over 7 days. Food portions were not recorded in this study. Eating small portions frequently certainly has lower risks than eating larger portions less frequently. As dietary patterns can vary according to seasons and the availability of food sources, these patterns need to be assessed over a longer time to find out whether adolescents' eating patterns place them at risk of developing breast cancer. Female adolescents' dietary patterns can still be changed because they still have a long time before developing breast cancer if they are at high risk. Consumption of sweetened foods and drinks can be reduced and balanced with high-

fiber foods like vegetables and fruits. The respondents reported leading a mostly sedentary lifestyle. They exhibited more sedentary behaviors over the weekend. They spent more than 5 hours watching TV, lying down, and sitting down. Therefore, female adolescents usually spent most of their time at home. The most popular activities involved chatting with friends, sitting, and lying down. Compared to their male counterparts, female adolescents led a more sedentary lifestyle than male adolescents. By contrast, female adolescents liked to spend their time chatting with friends or watching TV or movies [32]–[34].

Therefore, nowadays, adolescents tend to spend more time in front of screens. Most respondents were very aware regarding breast cancer. This high Alertness was shown by the knowledge they had of the disease (knowledge, risk factors, signs, and symptoms), their Alertness of the changes in their breasts, and their perception of ability to BSE. This was different from previous studies where the Alertness level in adolescents (16.2 years ± 0.9) was lower than that in older women (34.1 years ± 12,2) [35]. Female adolescents knew that breast cancer was an aggressive disease, which cancer could occur in any woman. However, they live in Surabaya, which is an urban area. Generally, someone who lives in an urban area has a higher Alertness than in a rural one. Urban areas require better information sharing and health services [36]. Previous studies reported that the knowledge of women living in urban areas was better than that of women living in rural areas [13]. While the respondents had a high level of Alertness, but they still had little knowledge about the risk factors of breast cancer. In Indonesia, discussions about reproductive health issues are still taboo. Therefore, female adolescents need to discuss more and be more informed about the risk factors and potential reproductive health issues. They need to know the risk factors of breast cancer, such as the changes in the breast, early menarche, abnormal menstrual cycle, hormonal imbalances, or lifestyle factors. The Indonesian Ministry of Health provided information on breast cancer risk factors, such as dietary patterns and unhealthy lifestyles [7], [37].The respondents had heard about breast cancer through the internet and social media but reported very little knowledge about risk factors, signs, and symptoms. Information about breast cancer should be improved in the sample population of this study. They knew that early diagnosis will increase the chances of being cured. Nevertheless, their perception of the ability to BSE was still poor. Poor BSE could be caused by fear – for example, if there were a sign of lumps - and shame [38], [39]. Their school did not have health-related majors or health education programs from health services. Some adolescents joined the Youth Red Cross, where they just learned basic health and first aid, while their knowledge of reproductive health was still poor. Based on interviews with teachers, the school did not have counseling services related to the health of their students. The Alertness the female adolescent had was only recorded at that time. Meanwhile, a woman needs to be aware of the risk for breast cancer risk during her entire life, from the moment she gets her first period.

The high alertness level does not indicate that in the future the Alertness will be high. Health promotions related to BSE need to be improved, starting from the government, health services, and schools. Schools can organize health counseling programs and consult health issues within their school. For female students, breast cancer is a frightening disease. They ate healthy foods and unhealthy foods, but mostly they followed a diet that was less likely to increase breast cancer risk. Where someone lives influences their dietary patterns. The dietary patterns of students who lived with their parents were different than those who lived alone or in boarding houses. Those who lived alone or in a boarding house tended to eat fast food more frequently than those who lived with their parents. Breast Cancer Research and Treatment [21] found that increased physical activity at the age of 12-17 years old can reduce the risk of breast cancer by 38%. Increasing physical activity decreases insulin resistance, adipose tissue, and chronic inflammation, and can also decrease the growth of sex factors hormone. A sedentary lifestyle during adolescence decreases the quality of life in the future. Previous studies showed that the longer the number of time children spent sitting down and generally leading a sedentary lifestyle, the worse their quality of life was in the future [40]. Adolescents who lead a mostly sedentary lifestyle can be influenced by the impact of their environment. Uncontrolled screen times - for example, the hours spent watching TV or playing on gadgets - at home contribute to this kind of lifestyle. The respondents reported that they would spend approximately 4 hours or more chatting with friends.

Technological advances–for example, easier communication using social media, moving from one place to another using transportation, buying and selling just using a screen - promote the sedentary lifestyle. These can decrease the number of times adolescents engage in physical activity, as they spend more time sitting or lying down, and hence increase the risk of developing breast cancer. Sedentary behavior is a phenomenon we cannot avoid. Therefore, a person is expected to do physical activity for at least 60 minutes every day. Limitations are noted for this research. Due to the cross-sectional design, only describe the state of the moment. The FFQ only assessed types of food, however not the portion size. Besides, this study just measure the respondents' eating behavior over seven days.

4. CONCLUSION

The female adolescent at the Vocational High School in Surabaya is very aware of the risk of breast cancer. This Alertness is significantly related to dietary patterns that reduce the risk of developing breast cancer in adulthood. However, they mostly led a sedentary lifestyle. A sedentary lifestyle in female adolescents may be due to technological advances making daily activities easier. While the female adolescents had a high level of Alertness, their knowledge of risk factors was still poor. Counseling about women's reproductive health, breast cancer Alertness, and the risk factors are needed. Thus female adolescents will be able to improve their lifestyle through a healthy diet, reducing sedentary behavior, and increasing physical activity.

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