# Vegetable Consumption Reduce Breast Cancer Risk Factors in Lampung Province

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**Abstract.** Breast cancer is a malignant tumor that originates from gland cells, gland ducts and breast supporting tissues. This type of cancer is the most commonly occuring cancer in women. In Lampung Province, the prevalence of breast cancer is the highest one. So far, the cause of cancer is still unknown. However, there are several factors that have been known to be able to reduce and increase the risk of this cancer, such as diet (fruits and vegetables). The purpose of this study was to identify the fruits and vegetables as the risk factors of breast cancer in the province of Lampung. The study held in RSUD dr. H. Abdul Moeloek Lampung and RSUD Jend. Ahmad Yani Metro. The study design was 'case control' with medical record observation instruments and interview guides. The sample involved 300 people, divided into two groups, 150 women with breast cancer and 150 women without breast cancer. The study variables consisted of breast cancer, vegetables and fruits. This study using logistic regression test analysis. The results showed that the risk factors associated with breast cancer were the infrequent intake of vegetables ($p = 0.00$; OR: 4.680) while the infrequent intake of fruits was not become a risk factor ($p = 0.054$). Since it is recommended to reduce breast cancer risk factors, it is highly recommended to consume vegetables frequently. Hopefully this study can be used as a reference in health promotion to the community which vegetable consumption as the prevention of breast cancer.

**Keywords:** Fruit · Risk Factors · Breast Cancer · Vegetables

## 1 Introduction

Breast cancer is the most common malignancy in women and the fifth leading cause of death from all cancer deaths in the world (626,679 deaths, 6.6%). Meanwhile, breast cancer is the leading cause and responsible for 15% of all female cancer deaths [23].

The incidence rates of breast cancer in women in Lampung province was 0.3‰ during 2013 with an estimated 1,148 [19]. In 2014, based on reports from 25 hospitals in Lampung Province, the number of breast cancer patients was the highest of all cancer cases. There were 383 cases of breast cancer (Ficardo, 2015) at the Regional General Hospital (RSUD) dr. H. Abdul Moeloek, Lampung Province. The number of breast cancer patients in 2016 were 144 people, in 2017 there were 205 and in 2018 there were


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206 people (Dr. H. Abdul Moeloek Hospital, Lampung Province, 2019). At the General Hospital Ahmad Yani Metro, breast cancer was the highest case in hospitalized patient in 2017 (Hospital Jend. A Yani Metro: 2018).

Breast cancer is a malignant tumor that originates from gland cells, gland ducts and breast supporting tissues such as the fatty, fibrous connective tissues and lymphatic tissue excluded breast skin. Breast cancer typically no symptoms when the tumor is small. The most common physical is a painless lump. Less common signs and symptoms include breast pain, persistent changes, such as swelling, thickening, or redness of the skin, and nipple abnormalities such as spontaneous discharge (especially if bloody), erosion, or retraction (American Cancer Sosiety, 2017; Desen Wan, 2013; Lee Jhon, dkk: 2008; Manuaba Tjakra W: 2010; Tkaczuk Katherin HR: 2017).

Breast cancer cases are increasing but the exact cause is not fully understood. Only some risk factors for breast cancer are known. The risk factors mean anything that increases a person's chances of developing breast cancer. However, having risk factors or even many, does not mean someone will definitely get the disease. The following are risk factors for breast cancer: related to diet [6, 7, 11, 14], hormone and reproduction factor [3, 4, 8] history of radiation to the chest or breast area, family history (Turnbull C, Rahman N, history of tumor disease, toxins in the environment [19].

Vegetables and fruit are risk factors associated with diet. Several studies show that there is a relationship between intake of vegetables and fruit in reducing the risk of breast cancer [5]. Study findings suggest that frequent consumption of vegetables is inversely associated with risk of estrogen receptor-negative/progesterone receptor-negative breast cancer, and that specific vegetables may be associated with a decreased risk of breast cancer overall [24] There is an association between higher fruit intake and lower risk of breast cancer.

This study is very necessary because the number of breast cancer patient continues to increasing, while vegetables and fruits which are predicted to reduce breast cancer risk factors are very easy to get in Lampung and the price is very affordable. The study question is whether vegetables and fruits are risk factors for breast cancer in Lampung, Indonesia.

## 2 Methods

### 2.1 Sample Size

The number of samples in this study was 300 people. The sampling technique is purposive sampling. The sample consists of two groups, a) case group: 150 women who suffer from breast cancer, have medical records at RSUD dr. H. Abdoel Muluk or RSUD Jend. Ahmad Yani Metro, and willing to participate in the study. b) control group: 150 women who do not suffer from breast cancer, are over 50 years old or have menopause, have an ID card from the province of Lampung - Indonesia, and willing to participate in the study.

### 2.2 Study Design and Data Collection

The design study was observation with a case control time approach. The study held in 2019 and the location is at RSUD dr. H. Abdoel Muluk, Jalan Dr. Rivai no. 6 Bandar Lampung and RSUD Jend. Ahmad Yani Metro Jalan Jend. A. Yani No. 13 Metro. The two hospitals were chosen as study locations because both of them are government-owned hospitals with good facilities. These hospitals have oncology surgeons, anatomical pathology specialists and radiology specialists and have supporting facilities and infrastructure to treat cancer patients such as chemotherapy rooms. The dependent variable in this study was: breast cancer (0 = not breast cancer patient, 1 = breast cancer patient). Breast cancer patients are women who are declared by an oncology surgeon to suffer from malignancy originating from gland cells, gland ducts and breast supporting tissues, excluding breast skin. Independent variable 1) fruit consumption (0 = often, 1 = rarely). Fruit consumption was the habit of consuming fruit a year before being diagnosed with breast cancer, while for case controls, a year before the study began. 2) Consumption of vegetables (0 = often, 1 = rarely). Vegetable consumption was the habit of consuming vegetables a year before being diagnosed with breast cancer, while for case controls, a year before the study began. The study was conducted after obtaining an ethical letter from the Health Research Ethics Committee of the Tanjungkarang Health Polytechnic, no. 282/EA/KEPK-TJK/IX/2019. Permission Letter from the Hospital Director, and Informed Consent from study subjects.

### 2.3 Instrumentation

The instruments used in this study were medical record documents, ID cards, and interview guidelines which contained the identity and habits of fruits and vegetables intake.

### 2.4 Data Analysis

The data obtained from the study were analyzed using: a) univariate analysis to determine the frequency distribution of characteristics of breast cancer patients. b) Chi-Square test is used to determine the relationship between two variables. c) Multivariate analysis using logistic regression analysis.

## 3 Results

### 3.1 Characteristics of Study Subjects

Based on Table 1, the average age of breast cancer patients were 50 years old both at the time of the study and at they were diagnosed (96 people: 84%). The youngest is 25 years old and the oldest is 77 years old.

Based on Table 2, breast cancer patient with no full-term pregnancies were 5 people (38.5%). While those who have more than two children are 80 people (44%).

**Table 1.** Distribution of breast cancer patients and non-patients based on age in RSUD dr. H. Abdoel Muluk, and RSUD Jend. Ahmad Yani Metro in 2019.

| Characteristics | Breast Cancer Patients | | Control (Non-Patients) | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Group Age (At The Time Of Study) | | | | | | |
| ≤50 Yo | 96 | 84 | 18 | 16 | 114 | 100 |
| >50 Yo | 54 | 29 | 132 | 71 | 186 | 100 |
| Group Age (At Cancer Diagnosis) | | | | | | |
| ≤50 Yo | 96 | 100 | - | - | - | - |
| >50 Yo | 54 | 100 | - | - | - | - |
| The Youngest Age (25 Yo) | 1 | 100 | - | - | - | - |
| The Oldest Age (77 Yo) | 1 | 100 | - | - | - | - |

**Table 2.** Distribution of patients with and not with breast cancer based on full-term pregnancies at RSUD dr. H. Abdoel Muluk, and RSUD Jend. Ahmad Yani Metro in 2019

| Full-term pregnancies | Breast Cancer Patients | | Control (Non-Patients) | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| 0 | 5 | 38,5 | 8 | 61,5 | 13 | 100 |
| 1 | 15 | 55,6 | 12 | 44,4 | 27 | 100 |
| 2 | 50 | 62,5 | 30 | 37,5 | 80 | 100 |
| >2 | 80 | 44 | 100 | 56 | 180 | 100 |

Based on Table 3, the education background of patients with and without breast cancer were distributed from elementary school to master's degree. Low education (elementary and junior high) was more dominated in breast cancer patients.

Based on Table 4, it is known; 1) breast cancer patient had less frequent intake of vegetables than control group (78%: 22%). 2) There was a differences in vegetable consumption between patients and non-patients with breast cancer ($p = 0.000$).

**Table 3.** Distribution of breast cancer patients and non-patients based on education at RSUD dr. H. Abdoel Muluk, and RSUD Jend. Ahmad Yani Metro in 2019

| Education | Breast Cancer Patients | | Control (Non-Patients) | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Elementary School | 46 | 52,3 | 42 | 47,7 | 88 | 100 |
| Junior High School | 39 | 73,6 | 14 | 26,4 | 53 | 100 |
| Senior High School | 44 | 55,7 | 35 | 44,3 | 79 | 100 |
| Diploma | 3 | 15 | 17 | 85 | 20 | 100 |
| Undergraduate | 14 | 31,1 | 31 | 68,9 | 45 | 100 |
| Postgraduate | 4 | 26,7 | 11 | 73,3 | 15 | 100 |

**Table 4.** The results of the chi square test on vegetables intake in patients with and without breast cancer

| Vegetables Intake | Breast Cancer Patients | | Control (Non-Patients) | | Total | |
|---|---|---|---|---|---|---|
| | Freq | Percent (%) | Freq | Percent (%) | Freq | Percent (%) |
| Rarely | 78 | 78 | 22 | 22 | 100 | 100 |
| Often | 72 | 36 | 128 | 64 | 200 | 100 |
| P = 0,000 | | | A = 0,05 | | | |

**Table 5.** The results of the chi square test on fruit intake in patients with and without breast cancer

| Fruits Intake | Breast Cancer Patients | | Control (Non-Patients) | | Total | |
|---|---|---|---|---|---|---|
| | Freq | Percent (%) | Freq | Percent (%) | Freq | Percent (%) |
| Infrequent | 114 | 62 | 70 | 38 | 184 | 100 |
| Frequent | 36 | 31 | 80 | 69 | 116 | 100 |
| P = 0,000 A = 0,05 | | | | | | |

Based on Table 5, it is known; 1) breast cancer patient had less frequent intake of fruits than control group (62%: 38%). 2) There was a significant differences in fruit intake between patients with and without breast cancer (p = 0.000).

**Table 6.** Results of logistic regression tests on fruits and vegetables intake in patients with and without breast cancer

| | B | SE | Wald | df | Sig. | Exp(B) | 95% CI for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Vegetables | 1,543 | 0,320 | 23,243 | 1 | 0,000 | 4,680 | 2,499 | 8,764 |
| Fruits | 0,564 | 0,292 | 3,714 | 1 | 0,054 | 1,757 | 0,990 | 3,117 |
| Constant | −2,935 | 0,475 | 38,203 | 1 | 0,000 | 0,053 | | |

Based on Table 6, it is known that vegetables intake variables are simultaneously related to the incidence of breast cancer ($p = 0.000$), and the OR value = 4.680. Meanwhile, fruits intake variable was not associated with breast cancer risk ($p = 0.054$).

## 4 Discussion

### 4.1 Vegetables and Breast Cancer

Vegetables are plant or part of plant such as leaves, stems, and flowers that used as food. This study shows that there was a relationship between vegetable intake and the incidence of breast cancer, where subjects with breast cancer rarely consumed vegetables. This study is accordance with the previous study [13]. This study supports evidence that high vegetable and fruit intake is associated with lower breast cancer risk [10]. The results suggest that a higher consumption of vegetable and fruit may be associated with a decreased risk of breast cancer [18]. Inadequate consumption of vegetables and consumption of soft drinks, industrially produced juices, fried foods, and sweets were identified as risk factors for breast cancer.

### 4.2 Fruits and Breast Cancer

The fruit is edible part of the plant which structure surrounds the seed and the structure originates from the ovary or as part of the flower itself.

This study shows that there was no relationship between fruit intake and the incidence of breast cancer, although subjects who suffered from breast cancer rarely consumed fruit. Perhaps further research is needed on certain fruits that are widely available in Lampung so that they can raise local wisdom.

## 5 Conclusion

The results of the study concluded that infrequent intake of vegetables and fruit was more common in subjects with breast cancer than those without breast cancer. However, the results of statistical analysis showed that simultaneously only vegetable intake was associated with breast cancer risk, while fruit intake was not associated.

### Limitations

1. The design of this study was case control, so that the objectivity was not so good because the research subjects had to recall the vegetables and fruits they consumed a year before suffering from breast cancer. While in the control group, subjects had to remember their consumption a year before the date of the study.
2. Researchers find it hard to choose controls that really fit the case group because of the many risk factors that must be controlled.

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**Conflict of Interests.** The authors declare that there are no conflict of interest.

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