# article

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**Title:** Awareness breast cancer screening regarding knowledge, barriers, and behavior among Indonesian women

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**Short Title (Running Title):** Awareness breast cancer screening among Indonesian women

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## Abstract

**Background**: Breast cancer is well known as the trigger of morbidity and mortality rate worldwide. While most developing countries with resources constrained setting, like Indonesia, encountered several difficulties to apply mass screening cancer.

**Aim**: To investigate knowledge, barriers, and behavior of women regarding breast cancer screening among rural and urban Indonesian women.

**Material and Methods**: This cross-sectional study was conducted of 864 Indonesian women who aged ≥ 18 years. A self-administered questionnaire using validated instrument was administered in March to May 2016. The ordered logistics regression model analysis was performed to further to evaluate five domains of awareness breast cancer screening and its determinants. A p-value under 0.05 was considered as significant.

**Results**: The majority of participant didn't have health insurance (60.49%). After social-demographic of participants were posed ordinal logistic regression model for all five domains of awareness breast cancer screening that demonstrated both women who completed their school tended to achieve a higher level of knowledge of signs and symptoms for breast cancer. While, several barriers to breast screening were noted such as religion, no health insurance, and women residing in remote areas.

**Conclusion**: Urban Indonesian women had adequate knowledge about cancer compared with rural women, while behavior related breast cancer screening was poor. Several participant characteristics such as marital status and women resided in remote areas identified as barriers to women's screening of breast cancer. Improving their knowledge of cancer screening particularly in breast cancer in the future is necessary and urgent.

**Key words:** awareness breast cancer screening, Indonesian women, level knowledge risk breast cancer

## Introduction

Breast cancer is one of kind cancer or malignant tumor which is uncontrolled cell growth, and is well known as the trigger of morbidity and mortality rate worldwide. The incidence and mortality rate of breast which is accounted these of overall diagnosed in the globe was 14.1 million new cases and 8.2 million occurred death of cancer. Moreover, breast cancer is the secondly common diagnosed cancer in females across the world. However, this disease is reported as the majority of cause of death among female (1). In recent year, most the mortality of breast cancer poses much higher in low and middle-income countries, like southeastern Asian countries, as compared to Western countries (1), (2). In Asian women, mortality rates of breast cancer accounted for over a half of death occurring among them, representing 22% of all new cancer cases. Notably, the highest mortality rates of breast cancer are found in Indonesia, although, its incidence rate is ranked secondly in the Asian countries (3).

More importantly, increasing the mortality rate of breast cancer in Asian countries especially in low and middle-income countries, like Indonesia, is likely reflected that this disease most diagnosed in advanced at the first presentation (4). As compared with Western, the mortality rate is slightly lower, reflecting the benefits of early detection, screening, and improving treatments where many patients with breast cancer have reasonably earlier diagnosed in their adequate healthcare settings (5).

Studies undertaken in Asian countries (6),(7), especially in developing countries and even among women minority in developed country (8), revealed that lack of resources was scare in their health system, including poor covered breast screening such as clinical breast examination (CBE) and mammography. A poor quality in health system implied poor early detection of breast cancer, thereafter breast cancer diagnosed in advanced thus have the potential to trigger shortening breast cancer survivor (9). Several difficulties in assessing healthcare such as long distances and located in remote area were also stipulated as barriers for women to perform breast cancer screening and treatment. Residing in rural areas was significant association with leading both distances and higher cost conveyance to access health care service (10).

Based on current poor resources in healthcare systems, most developing countries believe that improving strategy through rising breast cancer awareness may be feasible and cost-effective, before implementing widespread population-based screening (4), (11),(12),(13). Perhaps more importantly, increasing public awareness of risk breast led among women aware of changes in their own breast then pose them to early detection and treatment of breast cancer.

Numerous previous studies have identified on breast cancer awareness in Western (14), (15), Asia in general(16),(17). While, no studies in awareness breast cancer screening have focused on the differences between rural and urban women, especially in Indonesia. Therefore, we examined breast cancer knowledge, attitude to breast cancer prevention, barriers to breast screening, and health behavior related to breast cancer screening among rural-urban Indonesian women.

## Material and methods

### *Study Design and Sample Population*

A cross-sectional study was conducted in this study that carried out among Indonesian women. The study area, Indonesia, provides an interesting context for examining rural-urban disparities for two reasons. Indonesia encompasses a diversity of geographic settings and a huge archipelagic country. There are five major islands and about 30 smaller groups which are densely populated city to smaller metropolitan areas to remote rural extending 5,120 kilometers from east to west and 1,760 kilometers from north to south. Also, Indonesian are well known as multi-culture communities representing the spectrum of cultures, religions, and socioeconomics.

Based on the result of Oemiati et al., (2011), the incidence rate of breast cancer in Indonesia is reported higher, moderate, and lower by tree provinces in Indonesia. The subjects were randomly selected women between the ages ≥ 18 years. Those drawn from the town and districts of three provinces such as Yogyakarta, South of Sumatera, and East Nusa Tenggara, stratified by two locations (rural, urban) combinations. We felt these province-location combinations adequately represented the spectrum of cultures, religions, and socioeconomics in Indonesian women. Then, a self-administered questionnaire was administered in March to May 2016 to women with no history of breast cancer, who were neither pregnant or breastfeeding, and was literate in the Indonesian language.

### *Data Collection*

A validated instrument in two parts was employed in this study to collect data (18). The first part participants completed using sociodemographic characteristics, the second consisted data upon five domains of awareness breast cancer screening, such as knowledge of risk factors, knowledge of signs and symptoms, attitude to breast cancer prevention, barriers of breast screening, and health behavior related to breast cancer screening. The level of both domains such as knowledge of risk factors and knowledge of signs and symptoms were

assessed on 9 and 8 questions, possible answer being "yes/don't know/no", respectively. Of the 6 and 4 responses indicated both the level of attitude to breast cancer prevention and barrier of breast cancer screening, which were statements with five point Likert scale ranging from 1: 'strongly agree' to 5: 'strongly disagree". Lastly, the frequency of health behavior part related to awareness breast cancer screening has responded with 5 choices of the states listed.

Questions were on some sociodemographic characteristics, including age, province, education level, marital status, monthly household income, religion, occupation, health insurance, smoking history, alcohol history. Education level was classified into five groups: primary school, junior high school, senior high school, bachelor degree, and postgraduate degree. Monthly income was categorized as follows: less than 2,000,000 Indonesian rupiah (IDR)/month (1 US$ = ~ 13,500), 2,000,000 to 6,000,000 IDR/month, and more equal 6,000,000 IDR/month. Religion was grouped into three classes, such as Muslim, Christians, and others, while occupation was identified to five class as follows: farmer, trader, government/official/enterprise/business, and student.

**Ethics**

The study was approved by the Khon Kaen University Ethics Committee for Human Research (HE582369). All the women participating in this study were informed in detail about the study and their written consent was obtained. The Indonesian Ministry of Home Affairs (No.440.02/1085/Polpum) allowed to conduct the study.

**Statistical Analysis**

Descriptive statistics were used to summarize the participant characteristics of the study population. Measurement data were expressed as mean ±standard deviation (SD), and frequencies and percentages were employed for those that categorical. Additionally, ordered logistics regression model analysis was performed to further to evaluate five domains of awareness breast cancer screening level and its determinants. All data analysis was conducted using STATA statistical software version1 13, and a p-value under 0.05 was considered as significant.

## Results

### Sample characteristics

Of the 864 Indonesian women who aged 18 and over without breast cancer participated the study, for a response rate of 98.28%. Five hundred and thirty-six (62.04%) of them were

from the rural and 328 (37.96%) urban women. Overall, women in rural area didn't have health insurance (60.49%). The participant characteristics are reported in Table 1.

Table 2, Table 3, Table 4, and Table 5 provide the adjusted model using ordinal logistic regression model analyses for all five domains of awareness breast cancer screening. Overall, perusal of women level effects for multivariate model revealed a strong consistency in the direction of association for five domains of awareness breast cancer screening, such as knowledge of risk factors, knowledge of signs and symptoms, attitude to breast cancer prevention, barrier of breast screening, and health behavior related to breast cancer screening. Table 2 shows, although the adjusted effect of knowledge of risk factors for breast cancer was identified as significant for urban women than rural women (AOR urban women: 1.44, 95%CI: 1.07, 1.96, $p<0.05$) while after all covariate pooled to the level knowledge of signs and symptoms did not retain significant within rural and urban women. Women who completed higher level of education had 2.95 times the odds of higher knowledge of risk factors of breast cancer higher than increase (AOR: 2.95, 95%CI: 1.16, 7.49, $p<0.05$).

Surprisingly, in Table 3, women who resided in rural and urban area and three provinces, such as Yogyakarta, South of Sumatera, and East Nusa Tenggara did not significant when all covariate pooled to the level of risk factor of breast cancer. However, women with higher education had 2.85 times higher the odds of better knowledge signs and symptoms of breast cancer comparing with low educated women (AOR: 2.85, 95%CI: 1.08, 7.55, $p<0.05$). Urban women tended did not significant to perceived barriers to breast screening, but perhaps not surprisingly, their odds were decreased by 16% and 61% from women who lived in East Nusa Tenggara and being married respectively (Table 4) (AOR_East Nusa Tenggara: 0.17, 95%CI: 0.07, 0.41, $p<0.001$ and AOR_marry women: 0.62, 95%CI: 0.42, 0.91, $p<0.01$).

Perusal of Table 5 reveals that urban women tended decreasing the odds of higher level of behavior related to breast cancer screening than comparing their odds in rural women (AOR urban women: 0.61, 95%CI: 0.44, 0.83, $p<0.01$). This table also showed that although there was significant relation between no employment women with behavior related to breast cancer screening, the odds of better behavior was decreased in 42% of no employment women when compared to farmer (AOR: 0.43, 95%CI: 0.21, 0.90, $p<0.05$). In addition, compared to women with primary school (reference group), the women who completed senior high school had 2.84 times higher the odds of higher health behavior related to awareness breast cancer screening. This differences more pronounced with higher level of education. Regardless this pattern was found also evident for women who smoke experience and didn't have health insurance

(AOR_women smoking: 3.08, 95%CI: 1.18, 8.01, p<0.05; AOR_health insurance: 1.44, 95%CI: 1.09, 1.9, p<0.05).

**Discussion**

A comprehensive breast cancer screening policy for women at high risk of breast cancer is necessary, emphasized women in remote areas who have difficulties health services, particularly residence in an isolated rural. Overall the author observed that women in an isolated rural area, in particularly residence in isolated rural area, had obstacles in their health behavior to breast cancer screening, while to the best our knowledge, this is the first Indonesian study that exploring rural-urban differences in awareness breast cancer screening using large Indonesian women. Breast cancer screening has been known to reduce breast cancer mortality (19),(20). However, mass screening with clinical breast examination (CBE) and mammography utilized in developed countries cannot be equally applied to Indonesia, with a resources constrained setting (21). Increasing public knowledge and awareness both risk factors and signs and symptoms of breast is the key point to early detection of cancer, particularly in countries with limited resources likely in Indonesia. We felt having knowledge of early warning of breast cancer awareness and screening methods may have contributed to reducing the mortality rate of cancer particularly in breast cancer. In previous study reported particularly in developing countries, breast cancer has the highest number of new cases with many deaths occurring because of breast cancer. Almost three-quarters of new breast cancer cases occur in developing countries (1) and the incidence of breast cancer represents 48% of all cancers. Moreover, the mortality of breast cancer in this area is twofold of that in developed countries (1). Also, the diagnosed of breast cancer was in advanced stage.

The study result revealed that urban women were significantly associated with the higher knowledge level of a risk factor of breast cancer that compared in a rural area, while barriers of breast screening found no difference between those areas. The educational level was significantly associated with the higher knowledge level of both breast cancer risk factors and signs and symptoms of breast cancer in urban areas. These results are consistent with previous studies (22) that higher educated women are naturally expected to have ability for obtaining more and effective vary source information about risk factors (23), screening method (16) or awareness signs of breast cancer as we saw that women with higher education level relatives completed university level and high school compared with less educated ones. Previously study revealed that mostly attending women to mammography screening influenced by higher levels of their education(24). Interestingly, the trend of study result was the same for an educational

level but unlike married women, were could only be demonstrated a statistically significant difference at urban (25).

According to WHO, no health insurance is a widespread unequal universal health coverage in several developing countries (26). In our findings, the majority of participants didn't have health insurance. Health insurance itself was significantly associated to decrease a higher level of behavior related breast screening in rural women in particular. However, in terms of achievement of all ten indicators (participant characteristics) in urban women for the level of behavior of breast screening, we found that only isolated urban women (East Nusa Tenggara) and no alcohol consumption could be shown to be significantly associated with a better behavior to breast cancer prevention. Lack of positive attitude likely triggers diagnosis of breast cancer in advanced (27).

Interestingly, the present study adds new information that two variables effected with barriers breast cancer, such as women who were married and lived in the remote area, especially they lived in East Nusa Tenggara, were significantly associated with higher barriers of breast screening. Previously study in women in sub-Saharan Africa revealed that marital status had difficulties to seek health services regarding breast cancer screening, importantly in remote areas (7). Several barriers to breast screening are stipulated that it is negatively impacts the breast advanced.

Furthermore, women who resided in urban areas decreased better health behavior of breast cancer screening, meanwhile, the level knowledge of risk factor for breast cancer was adequate when comparing in a rural setting. Poor understanding/or misinformation the mammography and clinician process and women' fear health experience reflected a denial of breast cancer screening(28). Lack of understanding the benefit of breast cancer screening can considerably increase the highest breast cancer diagnosed in advanced, those its reflected shortening breast cancer survivor (9),(29). Furthermore, in urban women, this term was variously from monthly income, where higher monthly income increased better health behavior of breast cancer screening. This tends to impact on performances to clinical breast screening or mammography resulting in late diagnosis in many women.

The strength of our study reflects comprehensively assessment of the various themes identified and carried out using a relatively large sample of the general Indonesian population. This study employed the instrument with good psychometric validation which adjusted in Asian women with an appropriate sample size (18), (30). Lastly, we thought that our findings covered widely spectrum of Indonesian socio-demographic culture and

comparatively rural-urban combination for awareness breast cancer screening in Asian women, particularly in Indonesian women.

While, our study is limited by our cross-sectional data, so measures of five domains of awareness breast cancer screening and participant characteristics were measured concurrently. We had no information about the history of their beliefs for seeking help of disease (for example, they may have several reasons and difficulties to attendance medical doctor to check their breast or lack of their knowledge about early symptoms of breast cancer).

Finally, we conclude, this study demonstrated level knowledge adequacy of breast cancer among urban women, while lacking of behavior related to breast cancer screening especially clinical breast examination and mammography. Our findings emphasized understanding the benefits of early detection and presentation of breast cancer was poor among women. Several participant characteristics such as marital status and women resided in remote areas identified as barriers to women's screening of breast cancer. Improving their knowledge of cancer screening particularly in breast cancer in the future is necessary and urgent, especially for women aged 35 years and above.

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