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## Overview Of The Level Of Knowledge Of Young Women About Breast Self-Examination As An Early Detection of Breast Cancer

Chika Salsa Ardhana<sup>1)\*</sup>, Zulfa Mahdiatur Rasyida<sup>2)</sup>

<sup>1,2)</sup> Bachelor of Nursing Study Program, Universitas 'Aisyiyah Surakarta

\*Corresponding Author

Email : [zulfarasyida@aiska-university.ac.id](mailto:zulfarasyida@aiska-university.ac.id)

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### Abstract

Often due to late early detection despite the effectiveness of Breast Self-Examination (BSE) since adolescence. This study aims to describe the level of knowledge of female adolescents at Senior High School Batik 1 Surakarta about BSE. Using a quantitative descriptive design, the population was 682 female students, a sample of 87 female students via simple random sampling (Slovin formula). The BSE questionnaire instrument (18 Guttman items, valid  $r=0.389-0.745$ ; reliable  $\alpha=0.894$ ), univariate frequency/percentage analysis via SPSS (classification: good 76-100%, sufficient 56-75%, low  $\leq 55\%$ ). The results showed that 48.3% had sufficient knowledge, 42.5% had good knowledge, 9.2% had low knowledge; The majority were aged 14-17 years (97.7%), had not been exposed to information (77%), and had not practiced BSE (86.2%). The study concluded that the majority had sufficient knowledge, but needed intensive education to improve understanding and early detection behavior.

**Keywords:** Breast Cancer, Breast Self-Examination, Knowledge Level, BSE, Teenage Girls.

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## INTRODUCTION

Breast cancer is a chronic disease that is a leading cause of morbidity and mortality in women worldwide, including Indonesia, with cases increasing significantly every year. In Indonesia, GLOBOCAN 2022 data recorded 66,271 new cases of breast cancer, accounting for 16.2% of total cancer cases, while globally, the WHO reported 2.3 million new cases and 670,000 deaths in the same year. This trend is also seen in Central Java, where the number of sufferers increased from 11,742 in 2023 to 13,570 in 2024, with the highest number of cases in Surakarta City, reaching 1,336 cases in 2024.

The highest number of breast cancer cases in Surakarta is in Laweyan District, specifically the Pajang Community Health Center, with 134 cases in 2024, indicating a growing public health burden. Risk factors include age, genetics, obesity, unhealthy diet, and lack of exercise, which increasingly affect young women, including adolescents. Early detection through BSE is crucial, as delayed diagnosis leads to advanced stages in more than 50% of cases in Indonesia, reducing the chance of recovery.

The high death rate from breast cancer in developing countries is due to the lack of screening programs and early detection education, with clinical breast examination coverage of only 13.7% of the national target of 80%. In Indonesia, BSE awareness is only 25-30%, influenced by a lack of information and socialization, although YKPI has reached 23,000 people by 2020. The Ministry of Health Regulation No. 34/2015 emphasizes promotive-preventive measures such as BSE education, but implementation is still low.

Previous research, such as that by Immawati *et al.* (2023), found that female adolescents at Senior High School 1 Andong had low levels of BSE knowledge, while a preliminary study at Laweyan High School showed that 70.23% of female students at Batik 1 Surakarta High School had low levels of BSE knowledge. Supporting factors include a lack of counseling at school and limited exposure to information, which leads to adolescents rarely practicing BSE. This is exacerbated by a low understanding of the timing, method, and benefits of BSE at ages 14-17.

A study by Jaya *et al.* (2020) demonstrated that education significantly improves BSE knowledge and behavior. However, at Senior High School Batik 1 Surakarta, there has been no counseling, with the majority of female students not yet exposed to information. Laweyan has the

highest female high school student population (682), making this group vulnerable without timely intervention. This lack of knowledge potentially increases the risk of delayed detection in adulthood.

This study aims to describe the level of knowledge of female adolescents at Senior High School Batik 1 Surakarta regarding BSE as an early detection of breast cancer using a quantitative descriptive design with a sample of 87 female students via simple random sampling. The urgency lies in the increasing trend of local and national cases, where moderate-low knowledge risks worsening mortality if not addressed from adolescence, in line with the Ministry of Health's recommendation for early education to achieve the 80% detection target. The novelty of this study is the univariate descriptive focus on Senior High School Batik 1 Surakarta with a specific preliminary study of Laweyan (70.23% low), different from Immawati *et al.* (2023) in Andong (purposive sampling) and Siregar (2021) in Padang sidimpuan (variable relationship), as well as Soleman (2023) in female students.

## RESEARCH METHODS

This study used a descriptive design with a quantitative approach to describe the level of knowledge of adolescent girls about breast self-examination without intervention or variable manipulation. This approach is suitable for objectively identifying current phenomena through numerical data, as Sugiyono explains in quantitative research methods that emphasize systematic measurement. Furthermore, the descriptive design allows for a comprehensive understanding of the distribution of knowledge across the adolescent population, as Creswell recommends in quantitative research designs for observational studies.

The main instrument is a BSE knowledge questionnaire with 18 Guttman scale items (true/false, score 1/0), adopted from Aryanti Soleman (2023) and modified from Siregar (2021), which has been tested for validity ( $r$  count 0.389-0.745 >  $r$  table 0.361) and reliability (Cronbach alpha 0.894). Univariate data analysis techniques include editing, coding, transferring, tabulating, and frequency/percentage distribution using SPSS, with knowledge classification: good (76-100), sufficient (56-75), low ( $\leq 56$ ). This approach ensures the accuracy of descriptive data, in accordance with Sudaryono who emphasizes quantitative data processing for the validity of the results. Emzir added that the tested instrument supports univariate analysis in health education research.

The population was all 682 female students of Senior High School Batik 1 Surakarta in the 2025/2026 academic year, with a sample of 87 female students calculated using the Slovin formula ( $n = N / (1 + N d^2)$ ,  $d = 0.10$ ). The simple random sampling technique was applied randomly per class via a name draw, with the following inclusion criteria: age 10-21 years, female students of Senior High School Batik 1, able to read/write; exclusion: refusing or being absent during data collection. This strategy ensures representativeness, as Sugiyono suggests for probabilistic sampling in medium-scale quantitative research. Creswell emphasized that simple random sampling is ideal for descriptive generalizations in homogeneous populations such as school adolescents.

The procedure begins with the preparation stage (literature collection, preliminary study of Surakarta Health Office/Pajang Health Center/ senior high school, proposal, trial, Education Office permit), implementation (Senior High School permit, briefing of 3 enumerators, random sampling, informed consent, filling out questionnaires in the conseling room, termination), and final (data editing/coding, SPSS processing, report, trial). The location is at Senior High School Batik 1 Surakarta, October-December 2025, with primary data from questionnaires and secondary data from related documents. This systematic procedure follows research ethics (consent, confidentiality), according to Sudaryono for a structured quantitative methodology. Emzir and Creswell emphasize the logical sequence of procedures for the reliability of descriptive results.

## RESULTS AND DISCUSSION

### Respondent Characteristics

#### Age

**Table 1. Frequency Distribution of Age of Female Students of Senior High School Batik 1 Surakarta**

No.	Age	Frequency ( <i>f</i> )	Percentage (%)
1.	10-13 years	0	0
2.	14-17 years	85	97.7
3.	18-21 years old	2	2.3
Total		87	100.0

Based on table 1, the results of the highest frequency distribution are in the 14-17 year age group with a total of 85 respondents (97.7%), 2 respondents (2.3%) in the 18-21 year age category and no respondents or (0%) in the 10-13 year age group.

#### History of exposure to breast self examination information

**Table 2. Frequency Distribution of History of Exposure to BSE Information of Female Students of Senior High School Batik 1 Surakarta**

No.	History of exposure to information	Frequency ( <i>f</i> )	Percentage (%)
1.	Once	20	23.0
2.	Never	67	77.0
Total		87	100.0

Based on table 2, the results of the frequency distribution of history of exposure to breast self examination information show that the highest category is never, with 67 respondents (77.0%) and the lowest category is ever, with 20 respondents (23.0%).

#### Resources

**Table 3. Frequency Distribution of BSE Information Sources for Students of Senior High School Batik 1 Surakarta**

No.	Resources	Frequency ( <i>f</i> )	Percentage (%)
1.	Never	67	77.0
2.	Social media	9	10.3
3.	Print media	2	2.3
4.	Direct counseling	9	10.3
Total		87	100.0

Based on table 3 shows the results of the frequency distribution of information sources for BSE of female students at Senior High School Batik 1 Surakarta, most respondents had never received information about BSE, as many as 67 female students (77.0%). The most common sources of information obtained by respondents came from direct counseling as many as 9 female students (10.3%), social media as many as 9 female students (10.3%) and print media only 2 female students (2.3%).

#### History of performing breast self examination

**Table 4. Frequency Distribution of History of Performing Breast Self Examination in Female Students of Senior High School Batik 1 Surakarta**

No.	History of performing breast self examination	Frequency ( <i>f</i> )	Percentage (%)
1.	Once	12	13.8
2.	Never	75	86.2
Total		87	100.0

Based on table 4, the results of the frequency distribution of the history of performing breast self examination in female students at Senior High School Batik 1 Surakarta for the category of

never having done it were 75 respondents (86.2%) and the category of ever having done it were 12 respondents (13.8%).

### Overview of Knowledge Levels Regarding Self-Examination in Female Students of Senior High School Batik 1

**Table 5. Frequency Distribution of BSE Knowledge Levels in Female Students of Senior High School Batik 1 Surakarta**

No.	Level of Knowledge	Frequency ( <i>f</i> )	Percentage (%)
1.	Good	37	42.5
2.	Enough	42	48.3
3.	Low	8	9.2
	Total	87	100.0

Based on table 5, the results show that 37 respondents (42.5%) have a good level of knowledge, 42 respondents (48.3%) have a sufficient level of knowledge and 8 respondents (9.2%) have a low level of knowledge.

## DISCUSSION

### Respondent Characteristics

Respondent characteristics based on age of female students of Senior High School Batik 1 Surakarta

Based on the results of the study, the frequency distribution of respondents by age was highest in the 14-17 year age range (97.7%). This indicates that the study respondents were predominantly middle-aged adolescents, who are psychologically and biologically in the developmental phase of puberty (Hanum *et al*, 2025). This young age group generally has a good memory, a strong sense of curiosity, and a strong desire to maintain health.

Age can affect a person's level of knowledge because the older a person is, the more mature a person's level of maturity and strength will be in thinking and working, so that if given the right information from an early age it is hoped that it can increase awareness and the habit of performing BSE regularly (Jaya *et al.*, 2020). This study is in line with research conducted by Isnaeldha *et al* (2023) entitled Knowledge and Attitudes of Young Women About Breast Self-Examination (BSE) in Bumi Cabean Asri Sidoarjo, which shows that most teenagers are aged 16-19 years. The majority of the average age of high school students in Indonesia is around 15-18 years (Nursyam, 2023).

Based on the research results, the author can conclude that the characteristics of respondents at Senior High School Batik 1 Surakarta are dominated by female students aged 14-17 years who are included in the middle adolescent category. In this phase, adolescents are in the developmental period of puberty with the potential for high memory and curiosity, so it is an appropriate period for providing health education, especially related to BSE, which is expected to increase knowledge, awareness, and form the habit of performing BSE regularly.

a. Respondent characteristics based on history of exposure to breast self examination information in female students of Senior High School Batik 1 Surakarta

The results of the frequency distribution of respondents based on their history of exposure to BSE information showed that the majority of respondents had never been exposed to BSE information, namely 67 respondents (77.0%), while only 20 female students (23.0%) had been exposed. The high percentage of respondents who had never been exposed to BSE information indicates the lack of dissemination of information regarding early detection of breast cancer in the school environment. The lack of exposure to information about BSE can be influenced by the lack of support received by respondents. In the school and residential environment, there may not be adequate support regarding the implementation of BSE, especially support from peers (Hidayani *et al.*, 2022). The results showed

that low peer support contributed to the minimal response and motivation of female students to perform BSE examinations, even though respondents had received information about the examination (Khairunnisa *et al.*, 2025).

Many young women still lack health education about breast self-examination. This is evident in several studies showing that, despite the importance of breast self-examination as an early detection method for breast cancer, information and education provided in schools are still limited. Lack of or infrequent formal education or adequate information about breast self-examination leads to low awareness and understanding of the examination (Nisa *et al.*, 2021).

Exposure to information is a crucial factor in developing healthy knowledge and behaviors (Anisa and Suminar, 2023). These results indicate a relationship between information exposure and breast self-examination (BSE) behavior. The higher a person's exposure to information on early breast cancer detection, the better their BSE behavior, and vice versa. Repeated and intense exposure to information can increase an individual's awareness of their health. This condition encourages the development of better BSE behavior (Carolina *et al.*, 2024).

Based on the research results, the authors concluded that most female students at Senior High School Batik 1 Surakarta had never been exposed to information about BSE, indicating a lack of dissemination of information on early breast cancer detection within the school environment. This low level of exposure has the potential to impact female students' knowledge and BSE behavior, necessitating increased education and support, particularly from schools, families, and peers, to encourage better BSE behavior.

Respondent characteristics based on information sources of female students at Senior High School Batik 1 Surakarta

Based on the research results, there were 20 students who had been exposed to information with information sources accessed by respondents through direct counseling (10.3%), followed by social media (10.3%) and print media (2.3%), however, there were still many or the majority of female students who had never been exposed to information as many as 67 female students (77.0%). This shows that direct counseling is still a relatively effective source of information compared to other media. Although information technology has a large influence on adolescent health, the low utilization of social media as a source of health information indicates that digital media has not been optimally utilized as a means of health education for adolescents (Lala, 2020). There are still many female students who do not receive information about BSE, therefore it is better to seek more information to increase their insight and knowledge in performing BSE early. The existence of BSE information from several sources of information will increase a person's knowledge about BSE.

Information sources are the availability of information that influences a person's actions. Information sources are crucial because they relate to the level of knowledge that will influence a person's awareness of performing BSE (Hidayani *et al.*, 2022). Women will perform BSE if they receive clear information about its purpose, benefits, and how to perform it. This information can be obtained through health promotion and counseling through various media, such as social media, television, and print media (Sundari *et al.*, 2022). This is in line with research by Herawati *et al.* (2025), which revealed a significant relationship between BSE behavior and information media.

Based on the research results, the authors concluded that the majority of female students at Senior High School Batik 1 Surakarta had not yet received information on BSE. Among those who had received information, direct counseling was the most frequently accessed source of information compared to social media and print media. This situation indicates that the utilization of various

information sources, especially digital media and health promotion in schools, still needs to be improved to broaden the reach of information, increase knowledge, and encourage BSE awareness and behavior from an early age.

b. Respondent characteristics based on history of performing breast self examination in female students of Senior High School Batik 1 Surakarta

The results of the study showed that the majority of respondents had never performed BSE (75 female students, 86.2%), while only 12 female students (13.8%) had. This low level of BSE practice is influenced by a lack of knowledge and limited exposure to information regarding the method and benefits of BSE. Furthermore, age, embarrassment, and the perception that BSE is not yet important for adolescents may also contribute to low BSE practice (Ditiharman *et al.*, 2022).

Some female students have basic knowledge of BSE but also have limited understanding of the correct steps and timing of BSE, causing them to feel hesitant or lack confidence in performing it. Furthermore, some adolescents still perceive that breast self-examination is not necessary for adolescence, resulting in low levels of attention and interest in understanding BSE (Rusmawati *et al.*, 2025).

Based on the research results, the authors concluded that the majority of female students at Senior High School Batik 1 Surakarta have never performed breast self-examination (BSE). This low level of BSE practice is influenced by a lack of knowledge, limited exposure to information, and the perception that BSE is not important for adolescents. This situation indicates the need for continuous improvement in health education tailored to adolescent characteristics so that female students have the understanding, confidence, and awareness to perform BSE independently.

#### **Description of the Level of Knowledge about BSE among Female Students of Senior High School Batik 1 Surakarta**

Based on the research results, most respondents had a sufficient level of knowledge, namely 42 female students (48.3%), followed by a good category of 37 female students (42.5%) and a low category of 8 female students (9.2%). The dominance of the sufficient level of knowledge category indicates that some female students have general knowledge of BSE, but do not yet understand in depth the purpose, time, and steps of the correct BSE examination.

The results of this study are in line with the findings of previous research conducted Azizah and Sulistyoningtyas (2023), which showed that adolescent girls' knowledge of breast self-examination was at a sufficient level (58.3%). Various other studies have shown that knowledge of breast self-examination is strongly influenced by access to health information, health education experiences, and the sources of information obtained. This study Nurhadiyah *et al* (2020) shows that most young women have insufficient knowledge regarding BSE due to limited sources of information obtained, and there is a significant relationship between sources of information and the level of knowledge regarding BSE.

This fragmented knowledge level indicates the need for more structured health education interventions in schools. Although respondents had received BSE information, they did not perform the self-examination effectively, resulting in poor understanding. Nisa *et al* (2021) states that a person's knowledge can be influenced by several factors, including education, experience, age, interests, environment, information, socio-cultural factors, and economics. Knowledge is the result of the process of finding out, from not knowing to knowing, from not being able to being able, and this occurs after a person senses an object through his senses, such as the eyes, nose, ears, and so on. (Ridwan *et al.*, 2021).

The knowledge level, which is still dominated by the sufficient category, may also be influenced by the suboptimal method of delivering health information in schools. BSE information delivered without supporting media, demonstrations, or hands-on practice tends to be understood only

theoretically and is easily forgotten, as previously mentioned. Jannah and Timiyatun (2020) that health education that is only in the form of lectures has lower effectiveness compared to health education accompanied by audiovisual media and direct practice in increasing adolescent knowledge about BSE.

Lack of in-depth knowledge can also be caused by low awareness among adolescents about the importance of early breast cancer detection. Sari and Sulastri (2022) Research shows that some adolescent girls still perceive breast self-examination as unnecessary during adolescence, resulting in low levels of interest and understanding of BSE. This perception results in a lack of effort by adolescents to seek further information and practice BSE independently.

Apart from perception factors, support from the school and family environment also plays an important role in shaping adolescent knowledge. Soviadi and Hastono (2023) Studies have shown that adolescents who receive support from teachers and parents tend to have better reproductive health knowledge, including knowledge about breast self-examination (BSE). An open and supportive environment will encourage adolescents to be more active in asking questions and seeking information about their health.

The level of knowledge is considered adequate based on the characteristics of the 14-17 year old age group, which is developmentally within the middle adolescence phase. During this phase, adolescents begin to develop logical thinking skills, enabling them to understand health concepts, including breast self-examination. However, this ability has not yet been fully matched by experience, emotional maturity, and in-depth understanding, so their knowledge tends to be in the adequate category (Ko *et al.*, 2021).

The level of knowledge is sufficient based on the characteristics of respondents who have never been exposed to breast self examination information, which can have an influence because exposure to information is an important factor in the formation of knowledge. Knowledge can be formed through the process of sensing an object, one of which is through information (Kodir *et al.*, 2021). Limited exposure to information means that respondents do not yet fully understand the meaning, time of implementation and steps of the breast self examination examination, research by Windayanti *et al* (2023) shows that young women who have never received breast self examination information tend to have a level of knowledge in the sufficient to low category.

The level of knowledge is sufficient based on the minimal sources of information received by students, contributing to a suboptimal level of knowledge. Research conducted by Tucunan *et al* (2022) stated that diverse and reliable sources of information, such as health education and educational media, play a significant role in increasing adolescents' knowledge about health. Direct education is considered more effective because it allows for two-way interaction and clarification of information. Furthermore, the low number of respondents who obtained BSE information through media indicates that the use of digital media as an educational tool is not optimal because health information on social media is generally brief and unsystematic, making it less effective in increasing overall knowledge without the support of formal education (Lede *et al.*, 2024).

The level of knowledge is sufficient based on the low level of breast self examination practice, which is in line with the level of knowledge possessed by respondents. Knowledge plays a crucial role in driving healthy behavior, according to research. Kurniawati *et al* (2021) There is a relationship between the level of knowledge and the practice of breast self examination, respondents with good knowledge tend to be more active in performing breast self examination independently compared to respondents who have never performed breast self examination and generally have limited knowledge regarding the steps and the correct time for implementation.

Some adolescents have a good level of knowledge about breast self-exams (BSE), indicating they understand the importance of early breast cancer detection and recognize the purpose of the examination as a preventive measure and for early detection. Good knowledge is influenced by exposure to health information and experience performing self-exams. Good knowledge is crucial because it can encourage adolescent girls to perform regular breast self-exams and increase awareness

of abnormal breast changes, thus contributing to early breast cancer prevention at a young age (Windayanti *et al.*, 2023).

Based on the research results, the authors concluded that the level of knowledge of female students at Senior High School Batik 1 Surakarta regarding breast self-examination (BSE) was in the sufficient category. This indicates that female students have a general understanding of BSE, but do not yet have a deep understanding of its purpose, timing, and correct implementation steps. This condition is influenced by limited access and methods of information delivery, adolescents' perceptions of the importance of BSE, and support from the school and family environment. Therefore, more structured, continuous, and interactive health education is needed to improve female students' knowledge to the good category and encourage independent BSE behavior.

## CONCLUSION

This study found that the majority of female students at Senior High School Batik 1 Surakarta (48.3%) had sufficient knowledge about BSE, followed by good (42.5%) and low (9.2%), with respondents predominantly aged 14-17 years (97.7%), never having been exposed to information (77%), and not having practiced BSE (86.2%). These findings confirm the low level of in-depth understanding of the purpose, timing, and steps of BSE due to minimal exposure to information and school support, despite the availability of facilities such as the UKS. However, limitations include the descriptive design that does not test causal relationships, the limited sample of 87 female students from one school, and the potential for self-report bias in the questionnaire without direct observation.

Practical implications include encouraging interactive educational programs such as counseling with demonstrations in schools to improve knowledge and routine BSE behavior, in line with Minister of Health Regulation No. 34/2015. Suggestions for further research include quasi-experimental designs to test the effectiveness of interventions, multi-school stratified random sampling, and additional variables such as attitudes and social support for a more comprehensive exploration of influencing factors.

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