Breast Cancer Awareness among Bandung Adolescents

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Abstract Most breast cancer patients in Indonesia experienced a delay in their diagnosis due to a lack of awareness and other factors. Female adolescents are the key population for an educational intervention to raise breast cancer awareness. This study assessed knowledge of breast cancer risk factors, signs, and symptoms, attitudes toward breast cancer prevention, barriers in breast cancer screening, and behavior regarding breast cancer awareness among female adolescents in Bandung using the Breast Cancer Awareness Scale – Indonesia (BCAS-I) instrument. Among 371 female high school and undergraduate students, 53.1% of them had limited knowledge about breast cancer risk factors, and 99.2% of these respondents had negative behaviors. However, most of them understood the early breast cancer signs and symptoms (89.8%) and had positive attitudes toward seeking health support (98.7%). Preference of health information sources and educational level are the significant factors for breast cancer awareness. Our initial assessment may provide the basis for further research and surveys on a larger scale to develop breast cancer prevention educational materials appropriate for young female populations.

1. INTRODUCTION

Thirty percent of all cancer incidence in Indonesian women was breast cancer, which ranked as the most commonly diagnosed (16.6%) and second deadliest (9.6%) cancer (IACR, 2021). In 2040, this figure was predicted to rise to more than 50% (WHO, 2020). Despite this heavy public health burden, nationwide surveys have shown that breast cancer screening uptake in Indonesia has been poor (Pengpid & Peltzer, 2018; Solikhah et al., 2021).

In Yogyakarta, almost half of breast cancer patients were ≥3-month late at their first clinical visit due to a lack of awareness of the cause of the disease's symptoms (Hutajulu et al., 2022). While breast cancer screening from the age of 40 is a proven strategy to reduce mortality (Ray et al., 2018), it might be too late for Indonesian women since the peak age of breast cancer cases might be over ten years earlier than in Western countries (Lei et al., 2021). Data obtained from Padang (Harahap et al., 2018),

Surabaya (Devi & Ishardyanto, 2020), Jakarta (Yulian & Salim, 2018), and Yogyakarta (Sumadi Lukman Anwar et al., 2019) showed that incidence of young women (<40 y.o.) diagnosed with breast cancer might count up to 35% cases, and the disease is often present with aggressive pathology resulting in poor outcomes. Breast cancer symptoms, examinations, personal knowledge, and perception are the main factors related to delayed breast cancer diagnosis among women living in Asian developing countries (Sobri et al., 2021).

Maintaining a healthy body weight, performing regular physical activity, and moderating alcohol intake from a young age are known lifestyle modifications to reduce breast cancer risk. Therefore, adolescent girls are the apparent targets for breast cancer prevention (Colditz & Toriola, 2020). Breast Cancer Awareness Scale – Indonesia (BCAS-I) is a validated instrument

for assessing the knowledge, attitudes, barriers, and behaviors regarding breast cancer suited for the Indonesian context (Solikhah et al., 2017) This study aimed to assess breast cancer awareness among female high school and undergraduate students in Bandung.

2. METHOD

A purposive sampling was conducted by distributing an internet-based survey targeting high school and undergraduate students in Bandung (City of Bandung) between November 2020 and March 2021. West Java has the largest population of senior high school students (763,000) and the third-largest population of undergraduate students (826,000) (BPS, 2020b). The minimum number of participants required for this study was 384 as calculated (expected proportion 0.5 with 5% error) (Lemeshow et al., 1990) based on Bandung population count in 2020 (183,985 females aged between 15 and 24 years old) (BPS, 2020a). The ethical clearance was obtained from the Faculty of Medicine research ethics committee, Universitas Padjadjaran (no. 282/UN6.KEP/EC/ 2021).

The questionnaire (34 questions in 5 sections, approximate time needed: 25 minutes, link: http://www.bit.ly/awaskankerpayudara) was mainly based on the Indonesian back-translation of the BCAS-I instrument (Solikhah et al., 2019; Solikhah et al., 2017) and validated by two expert reviewers following an attempt to obtain the original questionnaire in the Indonesian language by contacting the author (Supplementary Data S1). Construct validation was performed on 30 volunteers, followed by an inter-question reliability check (Cronbach's alpha). Several questions were added in addition to the questionnaire, including informed consent and respondents' details (age, residential area, education level, race and religion, personal preference of health information sources, exposure history of any public counseling (community education) in their school or university, and personal history of breast cancer). Responses from registered students currently living in Bandung aged between 15-24 years old who agreed upon consent to participate in this survey were included in the analysis. Responses from non-students or students in a gap year (graduated from senior high school but not yet enrolled in their undergraduate study), incomplete, and repetitive responses were excluded.

Descriptive statistics were created to separately analyze senior high school and undergraduate student groups. A normality test was used to analyze each section result and select either mean or median score as cut-off value. In addition, univariate and multivariate analyses were made to analyze the influences of respondents' characteristics toward their questionnaire responses whenever possible. Statistical analysis was performed using the SPSS software version 26. The significance level was set at P <0.05.

3. RESULT AND DISCUSSION

At the end of the study period, 433 total responses were obtained. Among them, 371 responses (177 (47.7%) high school students and 194 (52.3%) undergraduate students) were eligible for analysis. The largest age group was 20-21 years old (n = 148; 39.9%)

followed by 16-17 years old (n = 115; 32%). Most respondents (n = 342; 92.2%) had never attended breast cancer seminars, counselling, or community education, and almost all of them (n = 369; 99.5%) had no history of breast cancer. The distribution of respondents' domicile was well represented in each eight sub-city areas, except in Karees sub-city area. The respondents' characteristics were compiled in Table 1 (attached). The respondents' domicile distribution was detailed in Supplementary Data S2 in Table 2 (attached).

3.1 Knowledge

The questionnaire for knowledge (Supplementary Data S3) includes questions regarding breast cancer risk factors (9 questions) and breast cancer signs and symptoms (8 questions) and scored as "yes" (2 points), "do not know" (1 point), and "no" (0 points). More than half of the respondents (n = 197, 53.1%) have poor knowledge (≥9 points) about breast cancer risk factors, despite most of them (n = 333, 89.8%) being knowledgeable (≥8 points) regarding breast cancer signs and symptoms.

Fatty food consumption (n = 225, 60.6%) and a family history of breast cancer (n = 195, 52.6%) were the most known risk factors among respondents. However, most of them (>87%) were not knowledgeable regarding early menarche (<12 years old), late menopause (>55 years old), and exposure to hormonal contraceptive drugs as breast cancer risk factors. Swelling, pain, and lump or skin thickening on the breast or armpit area were the three most known signs and symptoms (>70%), while puckering or dimpling/scaling around the breast was less known (<30%). Obesity was a less-known risk factor among high school students (16.9%), while undergraduate students (40.7%) may potentially benefit from further affirmation in this issue.

3.2 Attitude

The respondents' attitude was screened from their tendencies toward six issues related to breast cancer prevention and was evaluated with a 5-points Likert scale (Supplementary Data S4). Most respondents (n = 336, 98.7%) had a positive attitude (≥18 points) toward breast cancer prevention and early detection. However, the capability of routine mammogram tests in detecting breast cancer earlier was the most doubted by respondents (n = 146, 39.4%). In addition, the ability of fatty food restriction and physical exercise to reduce breast cancer risk was also doubted by a substantial amount of respondents (n = 84, 22.6%; n = 73, 19.7%, respectively), even though most of the respondents (n = 280, 75.5%; n = 293, 79%, respectively) agreed or strongly agreed.

3.3 Barrier

The questionnaire about barriers focuses on four personal issues potentially hampering breast cancer screening and was evaluated with a 5-point Likert scale (Supplementary Data S5). More than half of the respondents (n = 219, 59%) had a low level of personal barrier (<12 points) toward issues related to breast cancer screening. In particular, they feel that waiting in line for breast cancer check-ups is not too time-consuming (n = 225, 60.6%), and they disagree that they do not have time for breast check-ups

(n = 166, 44.7%). However, many responders agreed that going to a doctor for breast screening is uncomfortable (n = 197, 53.1%). It is also important to note that 197 (53.1%) respondents do not know how to perform breast self-examination.

3.4 Behavior

The questionnaire regarding behaviors includes seven questions about daily routines and is evaluated based on its frequency (5 scales) (Supplementary Data S6). Overall, almost all respondents (n = 368, 99.2%) had negative behavior toward breast cancer awareness. The only positive behavior that was quite frequently carried out was consuming fresh vegetables (n = 173, 46.6%). Frequent fried food consumption was common among respondent (n = 248, 66.8%). Most of the respondents sometimes perform physical exercise (n = 158, 42.6%), but the rest are rarely do it (n = 149, 40.1%) and only 64 (17.3%) respondents frequently do sport. Most of them also rarely (or never) heard about breast check-up programs by health professional in their area (n = 298, 80.3%), performing breast self-examination (n = 263, 70.9%), and get breast check-up at clinics (n = 362, 97.6%). It is also expected that almost all of the respondents (n = 369, 99.4%) rarely or never had mammogram test since such routine check currently applies only to women aged >40 years old.

3.5 Influences of respondents' characteristics on their breast cancer awareness

Interestingly, the high school students tended to have better knowledge about breast cancer risk factors (1.58 times, P=0.035), signs, and symptoms (3.57 times, P=0.002) than the undergraduate students (Supplementary Data S7). In addition, respondents who preferred their school as a health information source also had 1.67 times better knowledge regarding breast cancer signs and symptoms (P=0.004) than the others who preferred information from other sources.

3.5 Discussion

Cancer early detection relies on individual awareness towards small changes in their body (Desanti & Supriyati, 2010), attitudes toward issues, behaviors in relationship to risk factors (Gupta et al., 2020), and access to early detection clinical facilities (Wu & Lee, 2019). We found that Bandung adolescents were mostly well-informed about breast cancer signs and symptoms. However, educational approaches should emphasize breast cancer risk factors, particularly modifiable risk factors such as exposure to hormonal drugs (contraceptive agents) and obesity.

Most Indonesian (86.3%) tied their knot at the age between 16 and 24 (Katadata.co.id, 2020). Unfortunately, pre-marital education or counseling is not institutionalized yet. Otherwise, contraception choice and risk can be effectively advised. Obesity is an established breast cancer risk factor in premenopausal Asian women (Nindrea et al., 2019). It is also essential for adolescents to know that early menarche (<12 years old) is also a risk factor; therefore, they can put their efforts earlier on lifestyle modifications (Colditz & Toriola, 2020).

While mammogram test effectively detects breast cancer earlier, it is not a nationwide program is not covered by national health insurance (BPJS). The more realistic alternatives are encouraging adolescents for routine breast self-examination (SADARI) and breast examination by health professionals (SADANIS) (Yip et al., 2018). SADARI was introduced in 2008; however, the breast self-examination rate remains low (Sumadi L Anwar et al., 2018). Our finding also confirms that one of the common barriers for breast self-examination is as simple as because they do not know how to do it (Al-Dubai et al., 2012). Therefore, formally teaching breast self-examination to young adolescents in their school might greatly improve their skill and self-confidence.

The attitude to seek health professionals for breast check-ups should also be encouraged earlier in the teenage years. Attitude and behavioral adaptation require such practical knowledge to be integrated into formal education considering psychosocial and cultural aspects (Iskandarsyah et al., 2014). Therefore, an educational intervention in the sexual-reproductive system subject might be best applied to the school curriculum as early as 13 years old (junior high school). Lifestyle modification such as healthy food consumption and regular physical exercise, on the other hand, could be promoted to all ages. In the post-millennium era where information is abundantly available (but mixed with hoaxes and misinformation), the government and public health authorities should also prioritize quality public health education to prevent avoidable catastrophic health problems in coming years.

4. CONCLUSION

The application of the BCAS-I instrument for the adolescent population revealed helpful information regarding knowledge, attitudes, barriers, and behaviors towards breast cancer prevention. Therefore, specific education material on breast cancer prevention can be integrated into the school curriculum to promote healthy lifestyle modification among young females.

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CONFLICT OF INTERESTS

The authors declare that there was no conflict of interest in this study.

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APPENDICES

Table 1. Characteristics of respondents

Characteristics		n (%)
Age	15 y.o.	27 (7,3)
	16 y.o	58 (16,6)
	17 y.o.	57 (15,4)
	18 y.o.	36 (9,7)
	19 y.o.	15 (4,0)
	20 y.o.	50 (13,5)
	21 y.o.	98 (26,4)
	22 y.o.	28 (7,5)
	23 y.o.	2 (0,5)
Level of Education		
Senior high school		177 (47,7)
Bachelor and Diploma		194 (52,3)
Ethnicity		
Sundanese		258 (69,5)
Javanese		66 (17,8)
Chinese		11 (3,0)
Batak		9 (2,4)
Minangkabau		9 (2,4)
Acehnese		3 (0,8)
Betawi		3 (0,8)
Lampungese		2 (0,5)
Cirebonese		2 (0,5)
Balinese		1 (0,3)
Malay		1 (0,3)
Nias		1 (0,3)
Bantenese		1 (0,3)
Other ethnicity of Celebes-origin		1 (0,3)
Otherer ethnicity of Sumatran-origin		1 (0,3)
Other ethnicity of South Sumatran-origin		1 (0,3)
Other ethnicity of West Nusa Tenggara-origin		1 (0,3)
Religion		
Islam		338 (91,1)
Protestant		20 (5,4)
Catholic		9 (2,4)
Buddhism		3 (0,8)
Hinduism		1 (0,3)
Preferable information resources		
Social media and friends		133 (35,8)
Websites		99 (26,7)
Campus and lectures		18 (4,9)
Others		18 (4,9)
Extended family members		11 (3,0)
School		4 (1,1)
Experience of attending breast cancer counselling		
	Yes	29(7,8)
	No	342 (92,2)
History of breast cancer		
	Yes	2 (0,5)
	No	369 (99,5)

Table 2. Respondents' domicile distribution from BPS Badan Pusat Statistik (Statistics Indonesia, www.bps.go.id)

Domicile	n (%)	% per Sub City Area	
Area		BPS data	Study result
West Bandung		5.1	6.2
Karees Sub City Area			
Lengkong	4 (1,1)		
Regol	8 (2,2)		
Kiaracondong	12 (3,2)		
Batununggal	11 (3,0)		
Bojonegara Sub City Area		15	14.8
Andir	12 (3,2)		
Cicendo	12 (3,2)		
Sukajadi	19 (5,1)		
Sukasari	12 (3,2)		
Cibeunying Sub City Area		12.8	16.7
Bandung Wetan	21 (5,7)		
Cibeunying Kaler	8 (2,2)		
Cibeunying Kidul	12 (3,2)		
Cidadap	1 (0,3)		
Coblong	17 (4,6)		
Sumur Bandung	3 (0,8)		
Tegallega Sub City Area		17.4	17
Bandung Kulon	42 (11,3)		
Babakan Ciparay	5 (1,3)		
Bojongloa Kaler	6 (3,8)		
Bojongloa Kidul	4 (1,1)		
Astana Anyar	6 (1,6)		
East Bandung			
Arcamanik Sub City Area		9.1	11.3
Antapani	23 (6,2)		
Arcamanik	11(3,0)		
Mandalajati	8 (2,2)		
Ujung Berung Sub City Area		5.7	14.6
Cibiru	24 (6,5)		
Cinambo	1 (0,3)		
Panyileukan	21 (5,7)		
Ujungberung	8 (2,2)		
Kordon Sub City Area		4.9	10
Bandung Kidul	14 (3,8)		
Buahbatu	23 (6,2)		
Gedebage Sub City Area		5.1	6.2
Gedebage	19 (5,1)		
Rancasari	4 (1,1)		