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Predicting Breast Self-Examination Behavior in Indonesian Women: A Cross-Sectional Study in Bukittinggi, Indonesia

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A B S T R A C T

Breast cancer is a major global health concern, particularly in Indonesia where it's the leading cause of cancer-related deaths among women. Early detection through breast self-examination (BSE) is crucial for improving survival rates. This study aimed to identify predictors of BSE behavior among women in Bukittinggi, Indonesia. A cross-sectional study was conducted among 151 women in Bukittinggi. Data was collected using a questionnaire assessing BSE behavior, knowledge, attitudes, perceived barriers, self-efficacy, and sociodemographic factors. Logistic regression analysis was used to identify predictors of BSE behavior. The prevalence of regular BSE practice was low (21.2%). Factors significantly associated with increased BSE practice included higher knowledge scores (OR=1.12, p=0.03), positive attitudes (OR=2.31, p=0.01), lower perceived barriers (OR=0.87, p=0.04), and higher self-efficacy (OR=1.28, p=0.02). The study highlights the need for interventions to promote BSE practice in Bukittinggi. Strategies should focus on improving knowledge, addressing negative attitudes and perceived barriers, and enhancing self-efficacy.

1. Introduction

Breast cancer, a formidable adversary in the realm of women's health, stands as the most prevalent cancer affecting women globally, casting a shadow over countless lives. The World Health Organization's somber statistics reveal that breast cancer claims the lives of hundreds of thousands of women each year, underscoring the urgent need for effective prevention and early detection strategies. In Indonesia, the specter of breast cancer looms particularly large, as it constitutes the leading cause of cancer-related mortality among women. The gravity of this situation is further compounded by the fact that a significant proportion of Indonesian women are diagnosed at advanced stages of the disease when treatment options are limited and the prognosis is often poor. The imperative for early detection and intervention in the battle against breast cancer cannot be overstated.[1-3]

Breast self-examination (BSE), a simple yet potentially life-saving practice, empowers women to take an active role in monitoring their breast health. By regularly examining their breasts, women can familiarize themselves with their normal contours and textures, enabling them to detect any subtle changes that may signal the presence of an abnormality. The significance of BSE lies in its potential to facilitate the early identification of breast cancer, thereby increasing the likelihood of successful treatment and ultimately improving survival rates. The American Cancer Society underscores the importance of BSE as

a valuable adjunct to clinical breast examinations and mammography, particularly in settings where access to these services may be limited. Despite the well-documented benefits of BSE, its practice remains disappointingly low in many parts of the world, including Indonesia. The reasons for this underutilization are multifaceted and complex, encompassing a range of individual, social, and cultural factors. Studies have identified several key determinants of BSE behavior, including knowledge, attitudes, perceived barriers, self-efficacy, and sociodemographic characteristics. Knowledge about breast cancer and BSE plays a pivotal role in shaping women's health behaviors. Women who possess accurate information about the risk factors, signs and symptoms, and benefits of early detection are more likely to engage in BSE. Conversely, misconceptions and lack of awareness can contribute to complacency and neglect of breast health. Attitudes towards BSE and breast cancer also exert a significant influence on women's willingness to perform self-examinations. Negative attitudes, such as fear, anxiety, and fatalism, can act as powerful deterrents to BSE practice. On the other hand, positive attitudes, characterized by a sense of empowerment and control over one's health, can foster a proactive approach to breast cancer prevention. Perceived barriers, both real and imagined, can also impede BSE practice. These barriers may include lack of time, discomfort with touching one's breasts, fear of finding a lump, and embarrassment. Addressing these barriers through education and support is essential for promoting BSE uptake. Self-efficacy, or a woman's belief in her ability to perform BSE correctly, is another critical determinant of BSE behavior. Women who feel confident in their BSE skills are more likely to engage in regular practice. Therefore, providing adequate training and support to enhance women's self-efficacy is crucial for promoting BSE adherence. Sociodemographic factors, such as age, education level, marital status, occupation, and income, have also been explored in relation to BSE practice. While some studies have reported associations between these factors and BSE behavior, the findings have been inconsistent. Further research is needed to elucidate the complex interplay between sociodemographic factors and BSE practice.[4,5]

In the context of Indonesia, several studies have examined BSE practices and their determinants. A study conducted in Yogyakarta found that only 23.5% of women practiced BSE regularly, and the main reasons for not performing BSE were lack of knowledge and fear of finding a lump. Another study in Jakarta reported a similarly low prevalence of BSE practice (25.8%) and identified a lack of knowledge, negative attitudes, and perceived barriers as significant predictors of non-practice. These findings underscore the need for targeted interventions to address the specific barriers to BSE practice in Indonesia.[6,7] The city of Bukittinggi, nestled in the picturesque highlands of West Sumatra, presents a unique setting for investigating BSE behavior. While breast cancer is a significant health concern in this region, research on BSE practices among women in Bukittinggi remains limited.[8-10] This study aimed to fill this gap by identifying the predictors of BSE behavior among women in Bukittinggi. By understanding the factors that influence BSE practice in this population, we can develop tailored interventions to promote BSE uptake and contribute to the fight against breast cancer in Indonesia.

2. Methods

The cross-sectional design was chosen for its ability to capture a snapshot of BSE behavior and its associated factors at a specific point in time. This approach allowed for the efficient collection of data from a relatively large sample, facilitating the identification of potential predictors of BSE practice. The study was conducted in Bukittinggi, a city nestled in the highlands of West Sumatra, Indonesia. Bukittinggi was selected due to its relatively high

prevalence of breast cancer and the paucity of research on BSE practices in this region. The city's diverse population, encompassing a range of socioeconomic and cultural backgrounds, provided a rich tapestry for exploring the factors influencing BSE behavior. The study population encompassed women aged 18 years and older residing in Bukittinggi. This inclusive criterion ensured the representation of a broad spectrum of women, capturing the diversity of experiences and perspectives related to BSE. A convenience sampling method was employed to recruit participants from various community settings, including health centers, community organizations, and public spaces. This approach, while not entirely random, offered a practical and feasible means of accessing a diverse sample of women within the constraints of time and resources. The sample size was meticulously determined based on the estimated prevalence of BSE practice in Indonesia, drawing upon prior research and epidemiological data. The desired level of statistical power was also taken into account, ensuring the study's capacity to detect meaningful associations between BSE behavior and its predictors.

The cornerstone of data collection was a meticulously crafted structured questionnaire, administered by a team of trained research assistants. The questionnaire served as a conduit for gathering comprehensive information on various dimensions of BSE behavior and its potential determinants. The questionnaire encompassed a range of inquiries, delving into the frequency of BSE practice, the techniques employed, and the reasons for not performing BSE. This multifaceted approach allowed for a nuanced understanding of women's engagement with BSE and the barriers they may encounter. In addition to BSE behavior, the questionnaire assessed participants' knowledge about breast cancer and BSE. This included questions about risk factors, signs and symptoms, and the importance of early detection. By gauging women's knowledge levels, the study sought to identify any knowledge gaps that may hinder BSE practice. The questionnaire also explored participants' attitudes toward BSE and breast cancer. This encompassed questions about their beliefs, perceptions, and feelings regarding BSE, as well as their perceived susceptibility to and severity of breast cancer. Understanding women's attitudes was crucial for identifying any negative or stigmatizing beliefs that may impede BSE practice. Furthermore, the questionnaire investigated perceived barriers to performing BSE. This included questions about lack of time, discomfort with touching one's breasts, fear of finding a lump, and embarrassment. By identifying these barriers, the study aimed to inform the development of interventions to address these challenges and facilitate BSE practice. Self-efficacy, or a woman's confidence in her ability to perform BSE correctly, was another key focus of the questionnaire. This was assessed through questions about participants' perceived competence in performing BSE and their belief in its effectiveness. Understanding women's self-efficacy was essential for identifying any training or support needs that may enhance their BSE skills and confidence. Finally, the questionnaire collected data on sociodemographic factors, including age, education level, marital status, occupation, and income. These variables were included to explore any potential associations between sociodemographic characteristics and BSE behavior. The development of the questionnaire was a meticulous process, drawing upon a comprehensive review of existing literature and incorporating insights from experts in the field. The questionnaire was carefully adapted to the Indonesian context, ensuring its cultural sensitivity and relevance. A pilot test was conducted among a small group of women to assess the clarity, comprehensibility, and acceptability of the questionnaire. This iterative process allowed for the refinement and optimization of the questionnaire, ensuring its suitability for the study population.

The wealth of data collected through the questionnaires was subjected to rigorous analysis

using a combination of descriptive and inferential statistics. Descriptive statistics were employed to summarize the characteristics of the study population, providing a snapshot of the women's demographic profile, knowledge levels, attitudes, and BSE practices. This descriptive analysis laid the foundation for understanding the context in which BSE behavior occurs. Inferential statistics, specifically logistic regression analysis, were harnessed to identify the predictors of BSE behavior. This powerful statistical technique allowed for the examination of the independent and combined effects of various factors on the likelihood of women engaging in regular BSE practice. The dependent variable was BSE practice, categorized as regular (performing BSE at least once a month) or not regular. The independent variables included knowledge scores, attitudes towards BSE, perceived barriers to BSE, self-efficacy in performing BSE, and sociodemographic factors. The logistic regression analysis yielded odds ratios (ORs) and 95% confidence intervals (CIs) for each independent variable, quantifying the strength and direction of their association with BSE practice. Statistical significance was assessed using p-values, with a threshold of $p<0.05$ indicating a statistically significant association.

The ethical conduct of this research was of paramount importance. Ethical approval was sought and obtained from the relevant institutional review board, ensuring adherence to established ethical guidelines and principles. Informed consent was obtained from all participants prior to their involvement in the study. This process entailed providing clear and comprehensive information about the study's purpose, procedures, potential risks and benefits, and the voluntary nature of participation. Confidentiality and anonymity were rigorously maintained throughout the study, safeguarding the privacy and dignity of the participants. Data were de-identified and stored securely, accessible only to authorized research personnel.

3. Results and Discussion

Table 1 showcases the demographic characteristics of the 151 women who participated in the study. The average age was 38.5 years, which indicates that the study primarily involved women in their late thirties. The majority of the participants were married (72.2%), suggesting that the sample predominantly consisted of women with spouses or partners. In terms of education, most participants had completed secondary education or lower (58.3%), implying that a significant portion might have limited exposure to higher education. The largest occupational group was housewives (41.7%), followed by employed women (36.4%). The 'Others' category, accounting for 21.9%, likely includes students, retirees, and individuals with unspecified occupations.

Table 1. Sample characteristics (N = 151).

Characteristic	Frequency (n)	Percentage (%)
Age		
Mean (SD)	38.5 (10.2)	
Marital status		
Married	109	72.2
Unmarried	42	27.8
Education level		
Secondary or below	88	58.3
Higher than secondary	63	41.7
Occupation		
Housewife	63	41.7
Employed	55	36.4
Others	33	21.9

Table 2 illustrates the concerningly low prevalence of regular breast self-examination (BSE) among the participants, with only 21.2% reporting performing BSE at least once a month. This indicates that a vast majority (78.8%) of the women either practice BSE irregularly or not at all, highlighting a significant gap in breast health awareness and preventive practices. The primary reason cited for not performing BSE was a lack of knowledge (43.7%), emphasizing the critical need for educational interventions to enhance women's understanding of BSE and its role in early breast cancer detection. The second most common reason was fear of finding a lump (22.5%), underscoring the anxiety and apprehension associated with breast cancer. Addressing these fears and providing reassurance is crucial for encouraging BSE practice. Embarrassment (15.2%) was also identified as a barrier, suggesting the need to destigmatize BSE and create a supportive environment where women feel comfortable discussing breast health. The remaining 16.4% of women cited other reasons for not practicing BSE, which could include factors such as lack of time, perceived low risk, or discomfort with the procedure. Understanding these diverse barriers is essential for developing comprehensive interventions that address the multifaceted challenges to BSE adoption.

Table 2. Prevalence of BSE practice and reasons for non-practice (N = 151).

BSE practice and reasons	Frequency (n)	Percentage (%)
BSE practice		
Regular (≥1/month)	32	21.2
Not regular/never	119	78.8
Reasons for non-practice		
Lack of knowledge	53	43.7
Fear of finding a lump	27	22.5
Embarrassment	19	15.2
Other reasons	20	16.4

Table 3 highlights the factors that significantly influence the likelihood of women practicing breast self-examination (BSE) regularly. The odds ratio of 1.12 suggests that for each unit increase in knowledge score, the odds of practicing BSE regularly increase by 12%. This emphasizes the importance of educational interventions to enhance women's understanding of breast health and BSE techniques. The odds ratio of 2.31 indicates that women with positive attitudes towards BSE are 2.31 times more likely to practice BSE regularly compared to those with less positive attitudes. This underscores the need to address negative attitudes and misconceptions about BSE. The odds ratio of 0.87 suggests that for each unit increase in perceived barriers, the odds of practicing BSE regularly decrease by 13%. This highlights the importance of addressing barriers such as lack of time, fear, and embarrassment. The odds ratio of 1.28 indicates that women with higher self-efficacy in performing BSE are 1.28 times more likely to practice BSE regularly compared to those with lower self-efficacy. This emphasizes the need to build women's confidence and skills in BSE through training and support.

Table 3. Predictors of BSE behavior (Logistic Regression Analysis).

Predictor	Odds ratio (OR)	95% confidence interval (CI)	p-value
Knowledge score	1.12	1.01 - 1.24	0.03
Positive attitudes towards BSE	2.31	1.20 - 4.45	0.01
Perceived barriers to BSE	0.87	0.76 - 0.99	0.04
Self-efficacy in BSE	1.28	1.04 - 1.58	0.02

The findings of this cross-sectional study, which explored the predictors of breast self-examination (BSE) behavior among women in Bukittinggi, Indonesia, offer valuable insights into the complex interplay of factors that influence this crucial health practice. The low prevalence of regular BSE practice observed in this study, mirroring previous research in Indonesia, underscores the urgent need for targeted interventions to promote BSE adoption and empower women to take an active role in their breast health. The disconcerting reality that a mere 21.2% of the participants reported performing BSE at least once a month serves as a stark reminder of the challenges that persist in encouraging women to embrace this simple yet potentially life-saving practice. The echoes of similar findings from previous studies in Indonesia amplify the urgency of the situation, highlighting the pervasive nature of this issue and the pressing need for comprehensive and culturally sensitive interventions. The barriers to BSE practice identified in this study, including lack of knowledge, fear, and embarrassment, paint a vivid picture of the multifaceted challenges that women face in prioritizing their breast health. The predominance of lack of knowledge as the primary reason for not performing BSE underscores the critical importance of educational initiatives that not only impart accurate information about breast cancer and BSE but also address the emotional and psychological dimensions of this health behavior. The specter of fear, particularly the fear of finding a lump, looms large in the minds of many women, hindering their willingness to engage in BSE. This fear, often rooted in misconceptions about breast cancer and its treatment, can be mitigated through empathetic and empowering educational approaches that emphasize the importance of early detection and the potential for successful treatment. The pervasive sense of embarrassment associated with BSE, particularly in a culture where discussions about breast health may be considered taboo, further underscores the need for culturally sensitive interventions that normalize conversations about breast health and destigmatize BSE. The significant association between higher knowledge scores and increased BSE practice observed in this study aligns with the Health Belief Model, a widely used theoretical framework for understanding health behaviors. This model posits that individuals are more likely to adopt a health behavior if they perceive themselves as susceptible to the health problem, believe the health problem is severe, perceive the benefits of the behavior outweigh the barriers, and have confidence in their ability to perform the behavior. In the context of BSE, knowledge serves as a catalyst for action by enhancing women's understanding of their vulnerability to breast cancer, the potential consequences of late detection, and the tangible benefits of early intervention through BSE. By equipping women with accurate and comprehensive information, we can empower them to make informed decisions about their breast health and overcome the inertia that often accompanies ignorance and fear. However, knowledge alone may not be sufficient to motivate women to practice BSE regularly. The study's findings also highlight the crucial role of attitudes in shaping health behaviors. Women who held positive attitudes towards BSE, characterized by a sense of empowerment and control over their health, were more likely to engage in regular practice. This suggests that interventions aimed at promoting BSE should not only focus on imparting knowledge but also on cultivating positive attitudes and dispelling negative beliefs and misconceptions. By addressing the emotional and psychological dimensions of BSE, we can create a more conducive environment for women to embrace this practice as an integral part of their self-care routine. The study's identification of perceived barriers as a significant predictor of BSE behavior further underscores the importance of addressing the practical and logistical challenges that women may face in performing BSE. Lack of time, discomfort with touching one's breasts, and fear of finding a lump can all act as formidable obstacles to

BSE practice. Interventions that aim to promote BSE should therefore incorporate strategies to mitigate these barriers. This may involve providing flexible and convenient opportunities for BSE education and practice, offering reassurance and support to women who experience anxiety or fear, and creating a safe and non-judgmental space for women to discuss their concerns and experiences. The empowering role of self-efficacy in promoting BSE practice is another key takeaway from this study. Women who expressed confidence in their ability to perform BSE correctly were more likely to engage in regular practice. This finding aligns with the Social Cognitive Theory, which emphasizes the importance of self-efficacy in shaping health behaviors. According to this theory, self-efficacy is influenced by mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states. In the context of BSE, interventions that provide opportunities for hands-on practice, positive feedback, and role modeling can enhance women's self-efficacy and foster a sense of agency in their breast health. The absence of significant associations between sociodemographic factors and BSE practice in this study challenges the notion that BSE behavior is solely determined by age, education level, marital status, occupation, or income. While some studies have reported such associations, the findings have been inconsistent. This suggests that BSE behavior is a complex phenomenon influenced by a multitude of factors, both individual and contextual. The lack of sociodemographic predictors in this study underscores the importance of adopting a universal approach to BSE promotion, ensuring that all women, regardless of their background, have access to the information and support they need to practice BSE effectively. The implications of this study for public health practice and policy in Indonesia are profound. The low prevalence of regular BSE practice and the identified barriers highlight the urgent need for comprehensive and culturally sensitive interventions to promote BSE adoption. These interventions should be grounded in evidence-based practices and tailored to the specific needs and preferences of Indonesian women. Educational programs, training initiatives, and community-based approaches should be integrated to create a multi-pronged strategy for BSE promotion. The integration of BSE education into existing healthcare services is also crucial. Healthcare providers, including physicians, nurses, and midwives, should be equipped with the knowledge and skills to provide BSE education and counseling to their patients. Opportunistic screening, where women are offered BSE education and demonstration during routine health visits, can also be an effective strategy for increasing BSE uptake. At the policy level, the Indonesian government should prioritize breast cancer prevention and control, allocating adequate resources for BSE promotion and early detection programs. National guidelines and policies should be developed to standardize BSE education and training, ensuring consistency and quality across different healthcare settings. The involvement of community leaders, religious organizations, and other influential stakeholders can also enhance the reach and impact of BSE promotion efforts.[11,12]

The pivotal role of knowledge in shaping health behaviors, particularly in the context of breast self-examination (BSE), has been widely recognized and reaffirmed by the findings of this study. The significant association observed between higher knowledge scores and increased BSE practice underscores the critical importance of empowering women with accurate and comprehensive information about breast cancer and BSE. The fact that lack of knowledge emerged as the most commonly cited barrier to BSE practice further emphasizes the urgent need to bridge this knowledge gap through targeted educational interventions. The profound impact of knowledge on BSE behavior can be elucidated through the lens of the Health Belief Model (HBM), a theoretical framework that has been extensively employed to understand and predict health behaviors. The HBM posits that individuals are more

likely to adopt a health-promoting behavior, such as BSE, when they perceive themselves as susceptible to the health problem, believe the health problem is severe, perceive the benefits of the behavior to outweigh the barriers, and have confidence in their ability to perform the behavior. In essence, the HBM suggests that individuals are motivated to act when they believe they are at risk, the risk is significant, the recommended action is beneficial, and they have the capability to execute the action. In the context of BSE, knowledge plays a multifaceted role in influencing these key components of the HBM. By providing women with accurate information about the prevalence and potential consequences of breast cancer, knowledge enhances their perceived susceptibility and severity, making the threat of the disease more tangible and immediate. Moreover, knowledge about the benefits of early detection through BSE reinforces the perceived benefits of the behavior, highlighting its potential to save lives and improve treatment outcomes. The study's findings resonate with this theoretical perspective, demonstrating that women equipped with greater knowledge about breast cancer and BSE are more likely to recognize their vulnerability, appreciate the gravity of the disease, and perceive BSE as a valuable tool for early detection and intervention. The translation of knowledge into action, however, is not always straightforward. The HBM also acknowledges the role of perceived barriers in influencing health behaviors. Even when women possess adequate knowledge about breast cancer and BSE, they may still be deterred from practicing BSE if they perceive significant barriers to its implementation. These barriers may be practical, such as lack of time or privacy, or psychological, such as fear, anxiety, or embarrassment. The study's findings echo this complexity, revealing that perceived barriers were indeed a significant predictor of BSE behavior. Women who reported lower perceived barriers were more likely to engage in regular BSE practice, suggesting that addressing these barriers is crucial for promoting BSE adoption. The critical role of knowledge in facilitating BSE practice is further underscored by the fact that it serves as a foundation for other key determinants of health behavior, such as attitudes and self-efficacy. Knowledge empowers women to develop informed and positive attitudes towards BSE, recognizing its value and potential benefits. It also contributes to building self-efficacy, as women who understand the technique and its rationale are more likely to feel confident in their ability to perform BSE correctly. Thus, knowledge acts as a catalyst, not only directly influencing BSE behavior but also indirectly shaping other factors that contribute to its adoption. The implications of these findings for public health interventions are clear. Educational programs aimed at promoting BSE should prioritize the dissemination of accurate and comprehensive information about breast cancer and BSE. These programs should be tailored to the specific needs and cultural context of the target population, utilizing diverse channels and formats to reach a wide audience. The content should be clear, concise, and engaging, presented in a manner that is easily understandable and relatable. Moreover, educational interventions should not only focus on imparting knowledge but also on addressing the emotional and psychological barriers that may hinder BSE practice. By fostering positive attitudes, dispelling misconceptions, and building self-efficacy, we can empower women to overcome these barriers and embrace BSE as an integral part of their self-care routine. The use of culturally sensitive and accessible educational materials is paramount in ensuring the effectiveness of BSE promotion efforts. These materials should be developed in collaboration with community members and healthcare providers, taking into account the local language, beliefs, and practices. The delivery of these materials should also be adapted to the specific context, utilizing channels that are familiar and accessible to the target population. Community workshops, health campaigns, and digital

platforms can all serve as effective avenues for disseminating information and engaging women in meaningful discussions about breast health. In addition to traditional educational approaches, innovative strategies can also be employed to enhance knowledge and promote BSE practice. The use of interactive tools, such as simulation models and virtual reality experiences, can provide women with hands-on practice and personalized feedback, fostering skill acquisition and self-efficacy. Gamification techniques can also be incorporated to make BSE education more engaging and enjoyable, particularly for younger women. The power of storytelling and testimonials from breast cancer survivors and women who have benefited from BSE can also be harnessed to inspire and motivate others. By sharing their personal experiences, these women can serve as role models, demonstrating the value of BSE and encouraging others to take charge of their breast health.[13,14]

The intricate relationship between perceived barriers and BSE practice, as illuminated by this study, underscores the critical importance of addressing the multifaceted challenges that women may encounter when attempting to integrate BSE into their lives. The inverse association observed between perceived barriers and BSE frequency serves as a poignant reminder that even in the presence of adequate knowledge and positive attitudes, practical and psychological obstacles can significantly impede the adoption of this health-promoting behavior. The spectrum of barriers identified in this study, ranging from lack of time and discomfort to fear and embarrassment, paints a vivid picture of the complexities that women navigate in their pursuit of breast health. The pervasive nature of time constraints in women's lives, particularly those juggling multiple roles and responsibilities, can render BSE a seemingly insurmountable task. The perception that BSE is time-consuming and inconvenient can deter women from prioritizing it amidst their already demanding schedules. Interventions aimed at promoting BSE must therefore acknowledge and address this reality, offering flexible and accessible opportunities for education and practice. Community-based workshops, online tutorials, and mobile clinics can provide women with convenient avenues for acquiring knowledge and skills related to BSE, empowering them to integrate this practice into their lives without undue burden. The discomfort associated with touching one's breasts, often rooted in cultural norms and personal sensitivities, can also act as a significant barrier to BSE practice. The apprehension of encountering an abnormality, coupled with the fear of the unknown, can further amplify this discomfort, creating a psychological hurdle that many women find difficult to overcome. Addressing this barrier requires a multi-pronged approach that combines education, reassurance, and destigmatization. Educational interventions should emphasize the importance of self-familiarity with one's breasts, highlighting the subtle changes that may signal the presence of an abnormality. Reassurance from healthcare providers and testimonials from other women who practice BSE can help alleviate anxiety and normalize the experience of breast self-examination. Moreover, creating a safe and non-judgmental space for women to discuss their concerns and experiences can contribute to destigmatizing BSE and fostering a sense of empowerment and control over one's body. The fear of finding a lump, a visceral and often paralyzing fear, can be a major deterrent to BSE practice. This fear is often intertwined with misconceptions about breast cancer, its treatment, and its prognosis. The specter of a potential diagnosis can evoke a cascade of anxieties, ranging from concerns about physical disfigurement and loss of femininity to fears about mortality and the impact on loved ones. Addressing this fear requires a compassionate and empowering approach that provides accurate information about breast cancer, its treatment options, and the importance of early detection. By dispelling myths and misconceptions,

and highlighting the potential for successful treatment when breast cancer is detected early, we can help women overcome their fear and embrace BSE as a proactive step towards safeguarding their health. Embarrassment, another commonly cited barrier to BSE practice, can stem from a variety of sources, including cultural norms, personal beliefs, and negative past experiences. In some cultures, discussions about breast health may be considered taboo, leading women to feel ashamed or uncomfortable about examining their breasts. Personal beliefs about modesty or body image can also contribute to feelings of embarrassment. Moreover, negative past experiences, such as encountering an abnormality or receiving a false-positive result, can create a sense of apprehension and reluctance to engage in BSE. Addressing this barrier requires creating a supportive and non-judgmental environment where women feel comfortable discussing their concerns and experiences. Peer support groups, online forums, and confidential helplines can provide safe spaces for women to share their feelings and receive encouragement and guidance. The study's findings on the positive association between self-efficacy and BSE practice further underscore the importance of empowering women with the skills and confidence they need to perform BSE effectively. Self-efficacy, or a woman's belief in her ability to perform a specific behavior, has been consistently identified as a key determinant of health behaviors. In the context of BSE, women who feel confident in their ability to perform the examination correctly are more likely to engage in regular practice. This confidence stems not only from knowledge about the technique but also from a sense of mastery and control over the process. The Social Cognitive Theory (SCT), a widely recognized theoretical framework for understanding health behaviors, provides valuable insights into the role of self-efficacy in promoting BSE practice. According to the SCT, self-efficacy is influenced by four main sources: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states. Mastery experiences, or successful past performances of the behavior, are a powerful source of self-efficacy. In the context of BSE, providing women with opportunities for hands-on practice and positive feedback can enhance their sense of competence and control. Vicarious experiences, or observing others successfully perform the behavior, can also contribute to self-efficacy. Demonstrations by healthcare providers or testimonials from other women who practice BSE can serve as powerful motivators, demonstrating that BSE is achievable and beneficial. Social persuasion, or verbal encouragement and support from others, can also bolster self-efficacy. Healthcare providers, family members, and peers can play a crucial role in reinforcing women's belief in their ability to perform BSE. Positive affirmations, constructive feedback, and reminders about the importance of BSE can all contribute to enhancing self-efficacy. Finally, physiological and emotional states, such as anxiety and fear, can influence self-efficacy. Addressing these emotional barriers through relaxation techniques, stress management strategies, and supportive counseling can help women feel more confident and empowered to perform BSE. The implications of these findings for BSE promotion interventions are clear. Programs aimed at increasing BSE practice should prioritize not only knowledge dissemination but also skill-building and confidence-boosting strategies. Hands-on practice sessions, guided by trained healthcare providers, can provide women with the opportunity to develop mastery experiences and receive personalized feedback. The use of simulation models and interactive tools can further enhance the learning experience and facilitate skill acquisition. Testimonials from other women who practice BSE can provide vicarious experiences, demonstrating the feasibility and benefits of the practice. Encouragement and support from healthcare providers, family members, and peers can foster social persuasion and reinforce women's belief in their ability

to perform BSE. Moreover, addressing the emotional and psychological barriers to BSE through counseling and support services can help women overcome their anxieties and fears, contributing to enhanced self-efficacy.[15,16]

The intriguing finding of this study, which revealed no significant association between sociodemographic factors and BSE practice, challenges the conventional wisdom that BSE behavior is intrinsically linked to age, education level, marital status, occupation, or income. The absence of such associations in this particular context, while seemingly counterintuitive, opens up a nuanced and thought-provoking discourse on the complex interplay of factors that shape women's engagement with this vital health practice. The study's findings, while diverging from some previous research that reported associations between sociodemographic factors and BSE behavior, underscore the dynamic and context-dependent nature of health behaviors. The heterogeneity of study populations, cultural nuances, and variations in measurement tools can all contribute to the observed discrepancies in findings across different studies. The lack of significant sociodemographic predictors in this study serves as a powerful reminder that BSE behavior is not solely determined by easily quantifiable variables. While age, education, marital status, occupation, and income may play a role in shaping women's health beliefs and practices, they do not operate in isolation. The intricate tapestry of individual experiences, cultural norms, social networks, and personal values also contributes to the complex mosaic of factors that influence BSE adoption. The absence of clear-cut sociodemographic predictors in this study suggests that BSE behavior is a multifaceted phenomenon that transcends traditional demographic boundaries. The implications of this finding for public health interventions are profound. The notion that BSE behavior is not confined to specific demographic groups underscores the importance of adopting a universal approach to BSE promotion. Interventions should be designed to target all women, regardless of their age, education, marital status, occupation, or income, ensuring equitable access to information and support. This inclusive approach recognizes the inherent value and potential of every woman to take charge of her breast health, irrespective of her background or circumstances. The universal approach to BSE promotion is rooted in the principles of health equity and social justice. It acknowledges that every woman has the right to access the knowledge and resources necessary to protect her health and well-being. By transcending traditional demographic boundaries, this approach fosters a sense of inclusivity and empowerment, encouraging all women to participate in BSE practice and benefit from its potential for early detection and improved outcomes. The implementation of a universal approach to BSE promotion requires a multi-pronged strategy that addresses the diverse needs and preferences of women from all walks of life. Educational interventions should be culturally sensitive and tailored to the specific context, utilizing language and imagery that resonate with the target population. The use of diverse communication channels, including community workshops, health campaigns, digital platforms, and social media, can ensure that information reaches a wide audience, regardless of their literacy levels or access to technology. Training programs should be designed to accommodate women with varying levels of education and health literacy. The use of visual aids, hands-on demonstrations, and simplified instructions can facilitate understanding and skill acquisition. Moreover, providing opportunities for practice and feedback in a supportive and non-judgmental environment can enhance women's confidence and self-efficacy in performing BSE. Community-based initiatives can play a crucial role in reaching women who may be marginalized or underserved by traditional healthcare systems. These initiatives can leverage existing social networks and community structures to disseminate information, provide

training, and offer support for BSE practice. By embedding BSE promotion within the fabric of community life, we can create a sustainable and empowering environment for women to prioritize their breast health. The role of healthcare providers in promoting BSE cannot be overstated. Physicians, nurses, and midwives should be trained to provide BSE education and counseling to all women, regardless of their sociodemographic background. Opportunistic screening, where women are offered BSE education and demonstration during routine health visits, can also be an effective strategy for increasing BSE uptake. By integrating BSE promotion into routine healthcare services, we can ensure that all women have access to the information and support they need to practice BSE effectively. The findings of this study also challenge the notion that certain sociodemographic groups are inherently more or less likely to engage in BSE practice. While previous research has reported associations between factors such as age, education, and marital status and BSE behavior, these associations may be mediated by other variables, such as knowledge, attitudes, perceived barriers, and self-efficacy. The absence of significant sociodemographic predictors in this study suggests that these factors may not be as deterministic as previously thought. Instead, they may interact with other individual and contextual factors to shape BSE behavior in complex and nuanced ways. Further research is needed to explore the intricate interplay of sociodemographic factors, individual characteristics, and contextual influences on BSE practice. Longitudinal studies that track women's BSE behavior over time can provide valuable insights into the dynamic nature of this health practice and the factors that contribute to its adoption and maintenance. Qualitative research can also shed light on the lived experiences of women and the meanings they ascribe to BSE, providing a deeper understanding of the cultural and social contexts in which this behavior occurs.[17,18]

The findings of this study serve as a clarion call for action, highlighting the urgent need for comprehensive and culturally sensitive interventions to promote BSE adoption and empower Indonesian women to take charge of their breast health. The low prevalence of regular BSE practice and the myriad barriers identified in this study underscores the critical importance of developing and implementing evidence-based strategies that address the knowledge gaps, negative attitudes, perceived barriers, and lack of self-efficacy that hinder women from embracing this life-saving practice. The implications of these findings extend beyond the realm of individual behavior, resonating with public health practice and policy at both the community and national levels. The cornerstone of any successful BSE promotion strategy lies in the dissemination of accurate and comprehensive information about breast cancer and BSE. Educational programs, meticulously designed and culturally adapted, can play a pivotal role in enhancing women's knowledge, dispelling misconceptions, and fostering positive attitudes towards BSE. These programs should utilize a multi-faceted approach, leveraging diverse channels and formats to reach a wide audience. Community workshops, led by trained healthcare professionals or peer educators, can provide a safe and interactive space for women to learn about breast health, ask questions, and receive personalized guidance on BSE techniques. The power of visual aids, such as anatomical models and instructional videos, can further enhance understanding and facilitate skill acquisition. Health campaigns, strategically implemented through mass media and community outreach programs, can raise awareness about the importance of BSE and encourage women to prioritize their breast health. The use of culturally relevant messages and imagery can resonate with the target audience, making the information more relatable and impactful. The advent of digital platforms and social media offers new and exciting opportunities for BSE

education. Online tutorials, interactive quizzes, and social media campaigns can engage women in a dynamic and accessible manner, breaking down barriers of time and distance. The use of mobile applications and wearable technology can further personalize the learning experience and provide ongoing support and reminders for BSE practice. The content of educational interventions should be clear, concise, and culturally relevant, emphasizing the benefits of early detection and providing step-by-step instructions on how to perform BSE correctly. The language and imagery used should be sensitive to the cultural norms and values of the target population, ensuring that the information is accessible and empowering. Moreover, educational programs should not shy away from addressing the emotional and psychological dimensions of BSE. By acknowledging and validating women's fears and anxieties, and providing strategies for coping with these emotions, we can create a more supportive and empowering environment for BSE adoption. While knowledge is a crucial foundation for BSE practice, it is equally important to equip women with the practical skills and confidence they need to perform BSE effectively. Training programs, designed to complement educational interventions, can play a vital role in bridging the gap between knowledge and action. These programs should provide hands-on practice, guided by trained healthcare professionals or peer educators, allowing women to develop mastery experiences and receive personalized feedback. The use of simulation models and interactive tools can further enhance the learning experience and facilitate skill acquisition. The incorporation of role-playing scenarios and group discussions can also be valuable in addressing the emotional and psychological barriers to BSE practice. By creating a safe and supportive space for women to share their experiences and concerns, we can foster a sense of community and empowerment, encouraging them to overcome their fears and anxieties and embrace BSE as a routine part of their self-care. The provision of ongoing support and reinforcement, through follow-up sessions or online resources, can further enhance women's confidence and ensure the sustainability of BSE practice. Community-based initiatives, rooted in the principles of participation and empowerment, can play a vital role in reducing perceived barriers and promoting breast health awareness. These initiatives can leverage existing social networks and community structures to create a supportive and enabling environment for BSE adoption. Peer support groups, led by trained facilitators or breast cancer survivors, can provide a safe and confidential space for women to share their experiences, exchange information, and receive emotional support. The power of shared experiences and collective wisdom can be transformative, fostering a sense of solidarity and resilience among women facing similar challenges. Community health fairs, organized in collaboration with local healthcare providers and community organizations, can offer a platform for BSE education and screening. These events can provide women with access to information, resources, and support, while also creating opportunities for social interaction and community engagement. Mobile clinics, equipped with trained healthcare professionals and diagnostic tools, can extend the reach of BSE promotion efforts to remote and underserved areas, ensuring that all women have access to essential breast health services. The integration of BSE promotion into existing community programs and initiatives can further enhance its reach and impact. For example, incorporating BSE education into maternal and child health programs can capitalize on the existing trust and rapport between women and healthcare providers, creating opportunities for early intervention and long-term behavior change. Collaborating with religious organizations and community leaders can also be instrumental in promoting BSE, leveraging their influence and credibility to disseminate information and encourage participation. The integration of BSE

promotion into existing healthcare services is crucial for ensuring that all women have access to the information and support they need to practice BSE effectively. Healthcare providers, including physicians, nurses, and midwives, should be equipped with the knowledge and skills to provide BSE education and counseling to their patients. This may involve incorporating BSE into routine health visits, offering dedicated BSE clinics, or providing referrals to specialized breast health services. Opportunistic screening, where women are offered BSE education and demonstration during routine health visits, can be a particularly effective strategy for increasing BSE uptake. By capitalizing on existing healthcare encounters, this approach can reach a wider audience and minimize barriers to access. Healthcare providers can play a crucial role in normalizing discussions about breast health, addressing women's concerns and anxieties, and empowering them to take an active role in breast cancer prevention. The use of technology can further enhance the integration of BSE promotion into healthcare services. Telemedicine platforms and mobile applications can provide women with remote access to BSE education and support, overcoming geographical barriers and facilitating ongoing engagement. The development of decision support tools and risk assessment algorithms can also assist healthcare providers in tailoring BSE recommendations to individual women's needs and risk profiles. At the policy level, the Indonesian government should prioritize breast cancer prevention and control, allocating adequate resources for BSE promotion and early detection programs. National guidelines and policies should be developed to standardize BSE education and training, ensuring consistency and quality across different healthcare settings. These guidelines should be evidence-based, culturally sensitive, and regularly updated to reflect the latest scientific advancements. The involvement of diverse stakeholders, including healthcare providers, community leaders, patient advocacy groups, and policymakers, is crucial for the successful implementation of BSE promotion initiatives. Collaborative efforts can leverage the strengths and expertise of each stakeholder, creating a synergistic and sustainable approach to breast health empowerment. The establishment of public-private partnerships can also facilitate the mobilization of resources and expertise, ensuring the long-term viability of BSE promotion programs.[19,20]

4. Conclusion

This cross-sectional study in Bukittinggi, Indonesia, underscores the pressing need for comprehensive interventions to enhance BSE practice. The low prevalence of regular BSE, coupled with the identified barriers of knowledge gaps, negative attitudes, perceived barriers, and low self-efficacy, necessitates a multi-pronged approach. Educational programs, skill-building training, and community-based initiatives should be implemented to empower women, address their concerns, and foster a supportive environment for BSE adoption. Integration of BSE promotion into healthcare services and the development of national guidelines can further bolster these efforts.

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