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Awareness and Attitudes towards Breast Cancer Risk Factors among Female University Students in Bangladesh: Evidence from Sylhet District

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Abstract

Breast cancer is a growing health concern among women worldwide, with particularly rapid increases in low-and middle-income countries, including Bangladesh. Despite being preventable and treatable if detected early, it remains a neglected public health issue. Using Social Cognitive Theory, this study examines students' awareness and attitudes toward breast cancer, their perceptions of risk factors, and the influence of family and institutional settings on preventive practices. Using a qualitative approach within a social constructivist paradigm, the research involved 44 participants from six public and private universities in Sylhet District, including female students, guardians, and university administrators. Thematic analysis revealed that University students showed limited and vague awareness of

breast cancer, with misconceptions about its causes and prevention. Their attitudes were marked by shame, stigma, cultural silence, and fear, which discouraged open discussion and preventive practices such as breast self-examination. Understanding of breast cancer was largely shaped by family experiences and cultural myths rather than formal education. Cultural taboos and family silence often delayed symptom recognition and medical consultation. Institutional support was limited, with few seminars and awareness programs, and unavailability of female general healthcare practitioners reflect the institutional negligence of women's specific health needs. The study recommended gender and student-centered initiatives such as female-only seminars, "Girls' Help Desks," and culturally informed rural campaigns to normalize breast health discussions and empower female adolescents. The study highlights the need for a holistic, inclusive, and culturally rooted approach to improve awareness, challenge stigma, and foster proactive preventive behaviors among the university students in Bangladesh.

Keywords: Breast cancer, awareness, attitudes, risk factors, female university students, Bangladesh

Introduction

1. Background of the study

Cancer remains one of the most pressing global health challenges, representing a leading cause of morbidity and mortality worldwide, with one in every six deaths attributable to this disease (Barrios, 2022; Jaafar et al., 2023). Among all types of cancer, breast cancer stands out as a critical health concern for women. In 2018, breast cancer accounted for 12.3% of newly diagnosed cancer cases across genders, and approximately 25.4% of cases among women, excluding non-melanoma skin cancers (Akter & Ullah, 2022). The prevalence of breast cancer has been rising notably in Asian populations. While high-income countries have made substantial progress in early detection and treatment, low-and middle-income nations, including Bangladesh, continue to face challenges in recognizing and managing this disease (Morshid, 2023). Bangladesh currently reports approximately 1.5 million cancer patients with an estimated 150,000 annual deaths; however, reliable population-based prevalence data are scarce, complicating national-level planning and intervention (Begum et al., 2019). Globally, breast cancer-related mortality continues to rise, with more than half of deaths occurring in low- and middle-income countries (Islam et al., 2023). In Bangladesh, breast cancer accounts for nearly 69% of female cancer deaths, driven by delayed diagnosis, limited awareness, cultural myths, inadequate trust in healthcare services, and insufficient screening practices (Shamsi,

2021). These obstacles highlight the importance of examining awareness gaps among younger, educated women who may both face risks and influence wider community practices. University students, as an educated and potentially influential group, represent a critical population for understanding awareness gaps and shaping preventive behaviors. However, evidence shows that their awareness and preventive practices remain suboptimal (Sarker et al., 2022). Studies indicate that students generally demonstrate insufficient knowledge about risk factors, warning signs, and early detection methods (Almeshari et al., 2023; Rahman et al., 2019). Awareness also differs significantly between urban and rural students, with urban residents showing better knowledge and proactive health behaviors compared to rural counterparts (Okulicz-Kozaryn & Valente, 2019). Furthermore, higher education levels positively correlate with knowledge and practice of breast self-examination (BSE) (Abo Al-Shiekh et al., 2021). These findings underscore the pressing need for targeted educational interventions and awareness campaigns among female university students in Bangladesh. Factors such as geographic location, educational attainment, and family history of breast cancer significantly influence awareness levels, emphasizing the necessity of context-specific and culturally sensitive programs (Alam et al., 2021; Sarker et al., 2022). Early detection remains crucial, as many cases in Bangladesh are diagnosed at advanced stages when treatment options are limited and prognosis is poor. Although breast cancer has been widely studied, existing research in Bangladesh remains constrained by an urban focus, quantitatively driven samples, and a lack of attention to socio-cultural context. These limitations restrict meaningful understanding of how young women, particularly university students, construct awareness, shape attitudes, and interpret risk factors in their everyday lives. This study addresses these gaps through a qualitative inquiry that explores students' awareness and attitudes toward breast cancer, their perceptions of risk factors, and the influence of family and institutional settings on preventive practices. Moreover, by privileging participants' lived experiences and meanings, this research aims to generate nuanced, context-sensitive insights that can inform culturally appropriate awareness initiatives, educational interventions, and policy responses to promote early detection and reduce breast cancer vulnerability among Bangladeshi female university students. In addition, this study aligns with the Sustainable Development Goals, particularly SDG-3 (Good Health and Well-being), SDG-4 (Quality Education), and SDG-5 (Gender Equality), highlighting its relevance for both national health outcomes and global development priorities.

2. Awareness and attitudes of female university students towards the Breast Cancer risk factors: Theoretical overview

Social Cognitive Theory (SCT) was initiated by Albert Bandura that explains how individuals learn and practice skills in a particular area of health. It highlights the reciprocal and dynamic interplay of personal traits and factors, behavioral patterns, and the surrounding environment (Myrick & Yang, 2022). SCT suggests that behavior change is not a straight or isolated occurrence, and learning occurs through social settings as well as from experience, making it particularly relevant for exploring awareness and attitudes related to health risks such as breast cancer.

SCT's central element is observational learning or modeling, which is one of the strongest theories in which people learn new behaviors by observing others perform those behaviors, especially if they are considered role models, associates, or influencers (Nabi & Prestin, 2020). In the context of this study, female university students may develop an understanding of breast cancer risk factors by observing awareness campaigns, media representations, or conversations with peers and family members.

Self-efficacy, also referred to as self-belief, is another SCT core principle that focuses on one's perception of successfully performing a certain behavior. Self-efficacy determines whether an individual considers himself to respond to a particular action, how much effort he is willing to put into the action, and his level of persistence in the face of challenges (Usher & Morris, 2023). In health education, building self-efficacy is necessary to motivate individuals to adopt and maintain healthy habits. People with high self-efficacy are more likely to set goals, seek information, and take proactive steps. On the other hand, a person with low self-efficacy is likely to avoid or stop engaging in health-promoting actions because of fear or doubt. Higher levels of self-efficacy are associated with more proactive health behaviors.

Outcome expectations are SCT beliefs that form a construct of expected outcomes as a result of a particular behavior. These anticipated outcomes can be classified as either positive (e.g., expecting that illness detection increases the possibility of recovery) or negative (e.g., fear of examination due to its painful or embarrassing nature) (Fouad & Guillen, 2006). Expectations influence motivation and decision-making because people tend to act in accordance with what they believe is going to offer them positive returns. In most cases, education seeks to correct misconceptions by providing information and sharing positive stories about health, illness, and medical care.

SCT incorporates environmental context by including the physical and social environment, which provides opportunities and barriers to individual actions. The availability of health services, the existence of a

supportive network, sociocultural values and beliefs, organizational structures, and patterns of public relations shape health behavior. Based on the principle of reciprocal determinism, these ecological perspectives relate to the dynamic exchange of personal attitudes and actions (Usher & Ford, 2022). Broader cultural norms can either facilitate or hinder open discussions and preventive actions for breast cancer. Positive and negative consequences, also known as reinforcement, are crucial for behavior sustainment within the SCT framework. Praise, social approval, perceived rewards, and positive reinforcement can motivate the persistence of health-related activities. However, negative reinforcement such as ridicule, stigma, or social penalties can discourage certain behaviors, especially those that transgress societal norms or taboos. Stigma or ridicule may discourage individuals from addressing or discussing sensitive issues, such as breast health. As with many educational theories, the SCT has strengths and weaknesses. Its focus on social and cultural influences alongside cognitive processes gives it an edge in exploring challenging behaviors in delicate or culturally constrained contexts. SCT helps explain how policies, health education needs, and other initiatives are designed and implemented within the framework of health education. Through constructs such as observational learning, self-efficacy, outcome expectations, and environmental support or barriers, SCT enables the development of tailored solutions for health education and behavior change. This theoretical framework supports this study's exploration of awareness, attitudes, and the role of family and institutional support systems in promoting breast cancer risk education.

3. Methods and materials

This study followed a qualitative approach from a constructivist paradigm to examine students' awareness and attitudes toward breast cancer, their perceptions of risk factors, and the influence of family and institutional settings on preventive practices. A qualitative design was chosen as it allowed for an in-depth exploration of students' lived experiences and cultural contexts, providing deeper insight into the social and emotional factors shaping their awareness and attitudes toward breast cancer. The study is guided by Social Cognitive Theory (SCT), which explains how personal factors, behaviors, and social environments interact to shape learning and health practices. SCT provides a framework to understand how female university students' awareness, attitudes, and preventive actions toward breast cancer are influenced by observation, self-efficacy, and family or institutional support. The study was conducted in six universities in the Sylhet District, including both public and private: Shahjalal University of Science and Technology (SUST), Sylhet Agricultural University, Sylhet International University, Leading University, and Sylhet Metropolitan

University. Sylhet was selected due to its rising cancer incidence, influenced by factors such as smoking, poor diet, obesity, and physical inactivity, along with generally low awareness of breast cancer (Ullah et al., 2016). Many students come from rural areas, providing an opportunity to capture both rural and urban perspectives on awareness and attitudes. Additionally, Sylhet is a religiously and culturally sensitive region, which shapes attitudes, behaviors, and discussions around women's health issues, making it a particularly relevant context for this study. The study included a total of 44 participants (Table 1). Data were collected through semi-structured interviews, a focus group discussion (FGD), and key informant interviews (KII), comprising 30 female students, six guardians (through the FGD), six university officials (KII), and two medical officers (KII). Purposive sampling was employed to select participants, ensuring that the chosen individuals had relevant knowledge and experiences to contribute meaningfully to the study's objectives (Seawright & Gerring, 2008). University students were selected as the primary focus of this study due to their susceptibility to a lack of awareness and attitudes regarding breast cancer. Mothers were included in the focus group discussions because they play a pivotal role in health-related dialogues within the family and frequently convey cultural beliefs and practices to their daughters. University officials were incorporated into the study as they are responsible for overseeing health awareness initiatives and can offer an institutional perspective on the promotion of preventive activities. Additionally, medical officers were engaged as key informants, providing professional insights into the medical realities of breast cancer, the accuracy of societal perceptions, and the challenges associated with promoting evidence-based awareness. The principle of data saturation guided the determination of sample size, ensuring the collection of diverse yet non-redundant perspectives (Marshall et al., 2013; Fusch & Ness, 2015).

Table 1: Number of participants of the study

Types of participants	Nature of participants	Number
Students (Interviews)	Female university students conducting graduate	30
Guardians (1 FGD*6)	Guardians of the respective female students	6
University officials (KII)	Head of the institutions	6
Medical officer (KII)	Specialist doctors/nurses	2
Total		44

To facilitate better access and understanding, data were collected by local Sylheti female university students who were approximately the same age as the respondents. This approach minimized social distance, eliminated linguistic barriers by conducting interviews in the local Sylheti language, and encouraged participants to speak openly, fostering honest and detailed responses on the sensitive topic of breast cancer. Similarly, the focus group

discussion (FGD) with mothers was facilitated by a female of similar age, allowing them to share their experiences, beliefs, and challenges more freely. Interviews lasted on average 55 minutes, with the longest lasting 1 hour and 8 minutes, reflecting the depth of the discussion. This study used thematic analysis because it is highly flexible and widely applied across different fields of qualitative research. It allows for reflexive exploration of content, which is often missing in quantitative studies (DeJonckheere et al., 2024). This qualitative study employed various coding strategies including structural, provisional, and integrative coding. Structural coding, often referred to as open coding, is inductively derived from the data itself (Seddiky, 2021). Following Creswell's (2009) six-step framework, the researchers engaged in systematic coding, categorization, and theme development. Two cycles of coding were conducted: open coding, where concepts were identified and grouped, and selective coding, where categories were refined and integrated into broader themes (Seddiky et al., 2020). This process facilitated the identification of patterns and meanings within the data, supporting the development of a coherent narrative on students' awareness and perceptions of breast cancer risk factors.

Ethical consideration

Ethical considerations were strictly maintained. Informed consent was obtained from all participants, and they were assured of voluntary participation, confidentiality, and the right to withdraw at any stage without consequence. To enhance the validity and reliability of findings, strategies such as triangulation, peer debriefing, and member checking were applied. The researcher also practiced reflexivity critically reflecting on personal biases and assumptions throughout the research process. This study was approved by the SUST Research Ethics Board: Ref: SREB/SSS/PAD/02(2025).

4. Findings

4.1. Awareness and attitudes toward Breast Cancer

The findings from in-depth interviews with university students concerning their awareness, attitudes, and perceptions of breast cancer indicated a complex interplay of knowledge gaps, emotional obstacles, and cultural factors that influence participants' understanding and involvement with breast cancer issues. The qualitative findings revealed that most participants possessed limited prior knowledge of breast cancer. Their awareness was generally vague and inadequate; several participants mentioned that this was the first time they had a conversation about breast cancer, reflecting the silence and lack of open discussion surrounding the topic. Several participants stated that they didn't know much about breast

cancer before, though they had heard about it many times, but never realized the seriousness of the disease. Yet, for a significant number of participants, awareness was not shaped by information at all, but by lived experiences most often following the diagnosis of a close family member. Such encounters with illness, suffering, or even death not only produce emotional shock, but also disrupt participants' taken-for-granted sense of health and security. Through these experiences, participants came to recognise breast cancer as a serious health threat, which encouraged them to seek knowledge and acknowledge their vulnerability. As one participant noted:

> "My aunt had a lump in her right breast, but she didn't tell anyone at first because she was ashamed. Over a long period, the lump caused her immense pain, and she suffered greatly while trying to manage her daily life. Watching her endures the illness for months, experiencing both physical agony and emotional distress, and eventually witnessing her death was extremely shocking. Seeing how serious and relentless the disease was made me realize that I needed to learn more about it myself." (Interview 1)

Echoing this, another participant stated,

> "One of my sister's friends lost her mother to breast cancer. I was genuinely scared by that. I have wondered since then that she might have been rescued if we had known sooner" (Interview 6).

These narratives illustrate that awareness of breast cancer often emerged not from formal education or institutional initiatives, but through intense personal encounters with the disease. Such experiences motivated participants to actively seek information in order to make sense of what they had witnessed. They turned to sources such as the Internet, social media, books, and YouTube, as well as awareness campaigns and guidance from community health workers. Through these channels, some participants became familiar with symptoms like breast lumps, nipple discharge, skin dimpling, or changes in breast shape. However, while these efforts expanded their awareness, many acknowledged that their knowledge remained superficial, with little understanding of underlying causes, risk factors, or prevention.

One participant stated:

> "I got interested after seeing a campaign on Facebook, then I watched a video on YouTube about breast structure or nipple changes, etc., but I didn't know the details" (Interview 5).

Many participants lacked adequate resources to learn about breast cancer, relying primarily on digital platforms and casual conversations. Consequently, misconceptions about the disease were common. Some

participants believed that breast cancer could be caused by wearing tight or dark-colored bras, extramarital relationships, skin irritation, physical trauma, adulteration, or nerve-related complications. These misunderstandings were largely influenced by family word-of-mouth and unverified information circulating on social media and were inconsistent with evidence-based medical knowledge. In addition to misconceptions about the causes of breast cancer, participants also demonstrated limited practical knowledge for early detection. This study revealed a significant gap in knowledge regarding Breast Self-Examination (BSE). Most female participants were not only unaware of how to perform BSE but had never even heard of the term. In this context, one participant said,

> "I don't know about breast self-examination. I've never heard of BSE" (Interview 9).

Building on their limited knowledge and reliance on informal sources, most participants noted that breast cancer remains a largely unspoken topic within families, educational institutions, and society at large, where open discussion and awareness initiatives are scarce. While general health issues may occasionally be discussed in some households, conversations specifically addressing breast health are often avoided. Several participants reported that even discussions with mothers or sisters rarely included such topics, and many felt uncomfortable even uttering the word "breast". This silence often extended to participants' adolescent years, when breast cancer was rarely discussed openly in front of young girls. In some cases, participants were deliberately excluded from such conversations.
With a sense of discomfort, one student explained:

> "I share a lot with my mother, but I have never talked about breast health. I feel uncomfortable even talking about it" (Interview 17).

However, in a few exceptional cases, awareness was relatively higher in families in which someone was directly involved in healthcare. In such households, open dialogues about breast cancer were more common, and female members felt more comfortable discussing the topic. As one participant said:

> "My sister is a nurse, and my mom works in healthcare too, so we often talk about these things at home. It really helps me understand breast health better and feel more comfortable discussing it." (Interview 25)

Interestingly, the study revealed that many participants perceived breast cancer as a frightening and almost fatal disease. A diagnosis was commonly associated with breast removal, painful chemotherapy, or inevitable death, which created intense fear and hesitation, particularly when considering self-examination or seeking medical advice. This fear and

associated stigma were often reinforced by misinformation, social taboos, and cultural silence, leading to the neglect of preventive health practices and diminishing the confidence of young women. Many participants admitted that they had never performed breast self-examination (BSE) due to fear, discomfort, or embarrassment. Some viewed thinking about breast health as a sign of impending illness, while others avoided it entirely because of cultural notions of shame.

One participant said:

> "I think cancer means death. Treatment means chemotherapy and having a mastectomy" (Interview 9).

Despite these barriers, few participants demonstrated proactive behaviour regarding breast health. Some female participants reported regularly observing their breasts for changes in shape, skin colour, and nipple positioning while standing in front of a mirror. They explained that they engaged in this practice because they had been clearly taught the importance of breast self-examination (BSE) and were instructed on how to perform it correctly, either by health workers or during seminars. Participants emphasised that this guide helped them understand BSE as a simple, effective, and practical method for monitoring their health, which increased their confidence, awareness, and practices. One participant said:

> "I stand in front of the mirror every month and observe the shape of the nipples and the skin. A female doctor showed us BSE in action" (Interview 1).

To support this, another participant noted:

> "In my school, there was a monthly hour to teach them about female hygiene and other issues as the girls went through puberty. I learned about the chances of uterus cancer from period problems and other signs of period problems and PCOD and PCOS. If there are enough awareness program or seminar was available, I believe people would be more aware of the causes and what to after about any diseases" (Interview 4).

Although the participant discusses uterine health, her insights reflect a broader pattern: exposure to health education increases awareness and can motivate preventive behavior, which is equally applicable to breast cancer.

4.2. Fragmented knowledge and uneven awareness of risk factors

Analysis of the qualitative data revealed that university students' knowledge and understanding of breast cancer risk factors were heterogeneous and often fragmented, shaped by personal or familial experiences. While some participants demonstrated familiarity with scientifically recognized risk factors, many relied on misconceptions or

superficial information, highlighting significant disparities in awareness and reflecting gaps in women's health literacy. A limited number of participants showed clear awareness of medically acknowledged risk factors, including family history, hormonal imbalance, weight gain, long-term use of birth control pills, delayed motherhood, and exposure to cosmetics containing parabens. Importantly, a few participants translated this awareness into constructive preventive behaviours. These included wearing loose-fitting, cotton underwear, practicing proper hygiene, choosing fragrance-free cosmetic products, and performing regular breast self-examinations (BSE). One participant reported:

> "I felt ashamed of myself when I did the self-examination for the first time, but later I realized that it is like making friends with my body" (Interview 2).

Although only a few participants recognized environmental and lifestyle-related contributors like paraben-containing cosmetics, these insights demonstrate an emerging awareness of some external factors associated with breast cancer risk. While some reported a preference for "paraben-free" products, lack of consistent use was attributed to affordability, availability, and limited product literacy. Others admitted that financially prioritizing something other than the safer alternative made sustaining such practices very difficult. A few participants also mentioned that useful information about what the participants believed were harmful ingredients was difficult to obtain, leaving the participants reliant on advertisements and word of mouth. These constraints indicate that while awareness is incremental, external factors such as market availability, economic status, and health literacy barriers still exist. Their decision-making about risk factors has little "informed" understanding. Consequently, the ability to practice consistent behavior is also limited, and this seems to be the case with these participants.

As one participant noted:

> "I try to use cosmetics labeled 'Paraben-free,' but they are very expensive. I can't always afford them" (Interview 15).

In contrast, most participants endorsed unscientific or semi-scientific beliefs regarding breast cancer causation, including wearing tight or black undergarments, sleeping with a bra on, experiencing breast itching, extramarital relationships, poor hygiene, or consuming adulterated food. Such misconceptions underscore a lack of adequate health education and reliable information. One participant stated:

> "Breast cancer occurs if someone has an illicit relationship" (Interview 14).

Many students demonstrated only a vague understanding of breast cancer risk factors and lacked strategies to proactively acquire accurate information. While some expressed a desire to learn, they reported limited access to reliable resources and insufficient motivation to seek out further knowledge. This lack of knowledge is likely more pronounced in rural areas, where health education programs, awareness campaigns, and reliable resources are scarce. Participants recognized that low awareness in such settings could delay detection, increase misconceptions, and reduce preventive behaviors. One participant added:

> "As a university student, I didn't even know about the causes and consequences of breast cancer. Now, imagine what it's like in rural areas. Today, you came for the interview, and I learned so much. I will share this information with my friends and family" (Interview 11).

4.3. Family silence and cultural barriers

The qualitative findings indicate that discussions about women's health, particularly breast cancer, are largely absent within participants' families. Individuals often feel ashamed to talk about breast cancer, and many believe that families should avoid discussing breast health, considering it private or embarrassing. This cultural silence limits communication about preventive measures, early warning signs, and strategies for early detection. Due to this stigma, females in the household are often unable to seek help or disclose potential symptoms, and adolescent girls are frequently excluded from critical health information.

One participant stated:

> "There was a lump in my sister-in-law's breast. But no one told me because I was young. This issue was never discussed in front of me" (Interview 23).

Such familial control over health information constitutes a major barrier to raising awareness of breast cancer risks among adolescents and young women. Societal taboos surrounding words like "breast" and illnesses affecting it act as psychological and cultural constraints on open communication. Participants explained that breast cancer is often perceived as a "shameful" or "hidden" illness, particularly for unmarried women. The belief that disclosure could jeopardize a young woman's future marriage prospects reinforces family secrecy and limits timely medical care. One of the mother participants said:

> "In my neighbourhood, an unmarried woman was diagnosed with breast cancer, but only a few family members knew the true nature of her illness. The family would just say she had cancer, without specifying it was breast cancer. It wasn't until

> after her death that the full truth about her condition became known to the wider family" (FGD1).

The study also revealed that misinformation and limited knowledge among parents compound this problem. Some held unscientific beliefs regarding causation, such as attributing risk to not breastfeeding or irregular use of undergarments. Most were unaware of the practice of Breast Self-Examination (BSE) and lacked knowledge of how to perform it correctly. This deficit restricts the transmission of accurate health information to younger family members, reinforcing cultural silence and leaving adolescents ill-equipped to recognize early warning signs or seek timely medical care. A physician noted that

> "Most parents lacked adequate awareness of breast cancer risks and often preferred traditional treatment over scientific care. Many female patients had used homeopathic medicine, which seemed to suppress breast lumps, leading to delayed diagnosis and an increased the risk of breast cancer" (KII 2).

Communication within families was also gendered. Many participants reported feeling more comfortable discussing breast health issues with their mothers or sisters, while such conversations with male family members were rare due to embarrassment and cultural discomfort. This gap can delay medical care, as fathers often serve as primary decision-makers and financial providers. One participant explained:

> "I once had pain in my breast, and I became very frightened. Although I informed my mother, I couldn't visit a doctor in time. Eventually, the pain gradually subsided after two days. Later, talking to my friends, I found out that it was actually related to my period" (Interview 27).

Notwithstanding these challenges, certain households exhibited acts of support. Mothers and elder sisters became health promoters. Their encouragement often included educating younger women about health, urging them to see doctors in a timely manner, and addressing breast cancer myths. In some households, these women were primary decision makers, dictating health behaviors and making certain preventive measures to be observed. These practices showcase how education and awareness of women in the family can be utilized in a constructive manner.

One parent shared:

> "As an educated person, I always tell my daughter, 'As a girl, you have to take care of yourself.' And every year, I take her with me to get a check-up done by a female doctor" (FGD 1).

4.4. Financial and structural constraints

Several structural and systemic limitations related to breast cancer awareness were identified at the university level. Many participants expressed frustration that their universities did not offer organized health education programs addressing women's health issues not only breast cancer but also a range of other conditions that disproportionately affect women. Students noted that the absence of seminars, workshops, or targeted awareness initiatives left them with limited opportunities to acquire reliable information. As a result, they often relied on social media, family, or friends for guidance, which was frequently inconsistent or inaccurate. This lack of formal education and institutional support constrained students' understanding of preventive measures, early warning signs, and appropriate health-seeking behaviors, leaving them dependent on informal and sometimes misleading sources of information.

One participant stated the following:

> "It has been six years since I got admitted to the university, but I haven't seen any seminars yet" (Interview 9).

Although a few participants mentioned receiving health-related booklets or leaflets from university health clubs or awareness campaigns, these efforts were sporadic and insufficient. Despite the presence of medical centers in all universities, participants noted a complete absence of facilities for breast cancer screening or Breast Self-Examination (BSE) practice. University health services have also been reported to lack specific programs that address breast cancer awareness among female students. One participant stated:

> "In my university, there is a so-called medical center that only provides Napa[1] tablets. They have no programs on breast cancer or awareness initiatives on any serious diseases" (Interview 22).

The lack of qualified female healthcare providers in university medical centers emerged as a significant barrier to accessing care. Many participants reported feeling uncomfortable or embarrassed discussing sensitive health issues, such as breast health, with male doctors. This discomfort often resulted in delayed medical consultations or, in some cases, complete avoidance of seeking professional care, thereby limiting timely diagnosis, guidance, and treatment. One Participant shared the following:

> "There is a female doctor in the university medical center, but she is inactive. A dedicated counseling booth would be helpful" (Interview 13).

[1] Napa Tablet (paracetamol) is an analgesic and antipyretic used to relieve mild to moderate pain and reduce fever.

While some participants acknowledged that occasional seminars were organized through the Red Crescent Scouts or university medical units, they clarified that these programs were not specifically focused on breast cancer. Several university officials also admitted that existing healthcare services on campus were inadequate for addressing breast cancer and other sensitive women's health issues, citing financial constraints and the lack of trained personnel as key barriers to implementing screening or awareness initiatives. Although a few university representatives mentioned that sufficient medical professionals and counselling resources were available, this perception was contradicted by many female participants. Students described campus health services as inactive, inaccessible, or unresponsive to their specific needs, particularly regarding breast health. This discrepancy between institutional claims and student experiences highlights a critical gap in the university health infrastructure and underscores the need for more transparent, inclusive, and student-centered healthcare services. Specifically, there is a pressing need for initiatives tailored to women's health, preventive awareness, and accessible counselling to ensure timely detection and care.

4.5. Enhancing Breast Cancer awareness and support systems

4.5.1 Promotion of early education and awareness

Many participants emphasized the importance of integrating women's health education, particularly breast cancer awareness, into the formal education curriculum, beginning with secondary and higher secondary levels. They noted that earlier exposure to accurate information could help young girls recognize their symptoms and adopt preventive practices. One participant stated the following.

> "If our textbooks had even two pages on breast cancer, many girls could have known about it early" (KII 1).

The participants recommended organizing seminars and awareness campaigns within colleges and universities, calling for the active involvement of medical professionals, especially female doctors, who can create a safe and open learning environment.

4.5.2 Institutional measures and health Infrastructure

Participants expressed concerns that the lack of such professionals discourages students from seeking timely and appropriate care. To address this gap, participants proposed the creation of a dedicated "Girls' Help Desk" or health support platform, allowing students to consult without stigma or discomfort. Monthly health education sessions were also suggested to normalize such discussions and break the existing taboos. Seminars, conferences, and awareness weeks should be conducted for all students to

enhance their understanding of breast cancer, thereby enabling them to inform a broader audience. As One Participant Stated:

> "If there were a female counselor or doctor, many of us would go for advice" (Interview 3).

4.5.3 Overcoming taboos and misinformation through community outreach

Participants from rural areas reported that when a woman detected problems in her breast, she seldom sought qualified medical care. Instead, the prevailing response is to massage the area with heated oil or visit the nearest corner pharmacy, where attendants, most of whom lack formal medical training or a license to treat patients, dispense unregulated advice and medication. This reliance on home remedies and unqualified providers not only delays proper diagnosis and treatment but also reinforces the deep-seated taboos and misinformation surrounding breast cancer in remote communities. Participants of the study advocated community-based awareness campaigns using culturally sensitive and accessible language, including ward-level programs, street plays, and door-to-door visits, which were suggested as effective strategies to reach rural women and reduce barriers to communication.

One participant added:

> "The awareness should have been very easy if there was any program in community clinics, or any chairman member's house. Community arranges many programs related vitamin a capsule program, child vaccination program. If they are aware of the mothers on those programs, it would be very effective as if it is only about breast cancer campaign, people may feel shy and not come" (Interview 28).

4.5.4 Bridging knowledge gaps among male family members

Although opinions varied, many participants emphasized the importance of engaging male family members in breast cancer awareness, as fathers and husbands often act as financial providers and healthcare decision-makers. Their lack of awareness may delay diagnosis or treatment. One mother highlighted her concern:

> "If men aren't aware, treatment decisions may be delayed. Men should be aware about this, the person who will get the cancer could be his mother, wife, sister, daughter. If he had not enough information about the disease, its causes, consequences and treatment procedure then how the women get the treatment and all. As most of the woman are

> dependent on men economically. And the treatment is very costly (FGD1)."

Despite the recognized importance, participants also expressed concerns that involving men could lead to discomfort or ridicule, especially if they lacked maturity or sensitivity. Some boys make fun of or troll the issue. Boys even make sounds or tease if they hear about anything related to the period; women, most of the time, do not share any problem with men because the word "breast" is considered a symbol of sexualization. If they are not mature, it's risky to involve them. These insights suggest that male involvement must be carefully managed through culturally sensitive and gender-aware approaches. Participants widely recommended creating safe, women-led platforms for discussing breast health, combined with direct engagement from healthcare providers. Such spaces would allow women to ask questions, share experiences, and clarify misconceptions without fear of judgment. As one participant noted:

> "Just like we talk about fashion or makeup, we should talk about breast health too. That's how we'll get the courage to seek help" (Interview 1).

Participants also stressed that awareness should not be limited to women alone. Male family members and peers should be included to create a supportive social environment for emotional, financial, and medical support. Cultural norms and societal conservatism were also highlighted as barriers to open discussion about women's health. Women typically share information about breast health only with other women, while men remain largely unaware. This silence perpetuates misinformation, fear, hesitation, and delayed care-seeking. As one participant summarized:

> "A lot of people said that male family members and groups don't know much about breast cancer and other health issues related to it because these topics aren't talked about openly in society very often. The stigma around women's health continues because people are afraid to talk about it openly. This makes it harder to spread knowledge and get medical help when it's needed" (Interview 12).

5. Discussion

This study aimed to evaluate the awareness and attitudes toward breast cancer risk factors among female university students in Bangladesh. This study found that a greater proportion of female university students in Bangladesh had limited knowledge of breast cancer, which was largely influenced by their immediate environment rather than formal education. This is consistent with SCT's emphasis on the environmental determinants that shape health behavior, especially in the absence of structured

educational input. There was also widespread myth that breast cancer is caused by tight-fitting clothes or extramarital affairs, which reflects very low health literacy levels. Cultural taboos and family silence regarding breasts lead to discussion paralysis, which intensifies fear, embarrassment, and delays in seeking help. This mirrors SCT's idea of negative reinforcement and environmental barriers, where social stigma suppresses open health discussion. Systemic factors such as lack of facilities and information, awareness programs, and female healthcare providers at universities also limit access to vital information as well as preventive actions, such as Breast Self-Examination (BSE). These are clear environmental limitations of the SCT framework that limit behavior change by making affirmative actions difficult or uncomfortable. Regardless of these impediments, participants strongly expressed a willingness to acquire information and recommended early information, targeted campaigns, and an inclusive health infrastructure to shift the stigma. This demonstrates that latent self-efficacy in students, where providing the right support increases belief in the ability to change.

Most participants had inadequate prior knowledge, which emphasizes significant gaps in breast cancer awareness among female university students, often shaped by personal or familial experiences with the disease, a strong case of observational learning (a core SCT construct). Similar to other South Asian studies, such as those by (Alam et al., 2021; Joseph, 2024; Sarker et al., 2022), awareness was mostly activated by emotional nearness to a relative's diagnosis, rather than through education or public health initiatives. These findings support the observation that, in many low- and middle-income countries, available health knowledge is the result of knowledge gleaned from experience instead of being purposefully taught. In addition, there is a considerable lack of resources and infrastructure, which hinders the provision of formal health education. This reflects weak environmental facilitation, which SCT posits as a barrier to behavioral development. Hence, communities and family members become primary healthcare knowledge providers and depend on experience and anecdotal knowledge from previous generations (Fam et al., 2019). The study also demonstrates how cultural silence and social taboos surrounding breast health remain key barriers to open discussions, early detection, and preventive practices. As reflected in the narratives, the word "breast" is considered shameful or inappropriate in many households. This is an example of negative reinforcement where shame, embarrassment, and silence are socially rewarded or at least expected, discouraging open dialogue and healthy behavior, echoing findings from other studies that in Bangladesh, women do not want to talk about it, or they are not comfortable talking about this topic (Alam et al., 2021). These cultural constraints discourage early health-seeking behaviors, resulting in limited awareness of symptoms and

low adoption of Breast Self-Examination (BSE). Furthermore, the study highlights how misinformation often acquired through family word-of-mouth or unverified sources on social media reinforces fear, stigma, and fatalistic attitudes toward breast cancer. Beliefs that tight undergarments, extramarital relationships, or dark-colored bras can cause breast cancer illustrate how pseudoscientific myths continue to thrive in the absence of structured, evidence-based health education. This corresponds with similar misconceptions and myths found in studies across South Asia. In reality, people are unaware of the true nature of the disease (Joseph, 2024).

One of the most concerning findings is the widespread unfamiliarity with BSE, which mirrors the results of past research in Bangladesh, where 15 out of 43 participants reported a correct response rate of 34% overall, while another study revealed that only 32.2% of participants were aware of at least one method for breast cancer screening (Abbas & Baig, 2023; Roberto et al., 2020). Fear, embarrassment, and internalization of social stigma were cited as major reasons for avoiding breast self-checks, a phenomenon also identified by (Al-Marzouqi et al., 2025). Despite these barriers, a small subset of participants demonstrated encouraging behavior by regularly observing physical changes and practicing BSE after attending awareness sessions or interacting with female health care providers. This reflects increased self-efficacy through exposure to models (observational learning) and supportive environmental conditions (female doctors and targeted learning).

The results illustrate a profoundly inequitable level of breast cancer risk awareness among university students in Bangladesh, revealing gaps in women's health literacy. Only a small subset of participants appeared to be aware of evidence-based risk factors including hormonal imbalance, family history, childbearing age, and paraben exposure. The majority subscribed to cultural beliefs and hearsay coupled with scant knowledge. This again reflects weak outcome expectations and limited self-efficacy, which limit proactive behavior. This gap in knowledge is consistent with previous studies that have reported that awareness of breast cancer in low- and middle-income countries is usually fragmented because of the limited availability of health information, restricted access to health education, and sociocultural taboos related to women’s health (Srinath et al., 2022; Yip et al., 2014). Participants who identified environmental and lifestyle-related risks, such as the use of paraben-enriched cosmetics, marked a notable shift toward more proactive health behavior. Simultaneously, the inability of these women to regularly access safer products because of costs highlights the intersection of health awareness and economic limitations. On the contrary, the prevalence of myths under garment color, sleeping positions, or extramarital relationships strongly points to the need for well-structured

evidence-based breast health education in universities. These misconceptions exacerbate the risk of delaying the necessary interventions and increasing vulnerability among young women. The study emphasized that a structured learning environment can increase both self-efficacy and expectations for accurate outcomes, which are crucial for sustainable behavioral change under SCT.

The results of this study emphasize the detrimental effects of familial silence and culturally rooted taboos on young women's access to critical information regarding breast cancer. Regarding many participants, breast health is often stigmatized and absent from routine family dialogue, especially when children are present. This finding supports previous literature that argues that cultural discomfort and perceived shame associated with female body matters delay early health education in South Asian cultures (Mubarik et al., 2022). The absence of information available to young girls, as described in this study, reinforces the intergenerational cycles of ignorance and exploitation. Moreover, the study found the strongest latent will to learn and preventive behaviors to adopt protective measures among individuals who have had personal or family experiences with the disease. This underscores the potential value of knowledge gap awareness initiatives designed through peer-led frameworks, which can serve as social modeling tools to increase observational learning and community-based self-efficacy. Therefore, the findings support integrated awareness approaches that incorporate cognitive (knowledge) and structural (access and affordability) elements of risk prevention.

Parents' lack of understanding of science significantly contributes to the communication gap. Guardians maintaining unscientific beliefs, such as associating breast cancer with improper feeding or undergarment habits, not only misinform but also dissuade evidence-based preventive measures such as Breast Self-Examination (BSE). This is consistent with (Chao et al., 2020), who reported that limited knowledge and misconceptions about breast cancer risks, their symptoms, and how they are managed contribute to delays in seeking appropriate healthcare. In addition, within the household, prevailing gender norms constrain discussions with females; thus, male guardians are left out of critical conversations, even though they are the principal decision-makers and financiers for healthcare services. Such dynamics can delay critical care during an emergency. Despite this, the study highlighted promising instances in which mothers and elder sisters initiated the education and support of younger females, pointing to family centered approaches as a basis for targeted awareness campaigns. These family members act as social models in practical observational learning.

Additionally, this study found that women can transform their silence surrounding these issues when equipped with appropriate knowledge.

Therefore, fostering intergenerational discussions and providing mothers with accurate health information could serve as culturally appropriate and sustainable substantive intervention strategies for enhancing awareness and promoting early detection.

This study highlights the critical institutional gaps within the university context that most profoundly obstruct attempts to promote breast cancer awareness and preventive initiatives. Almost all participants reported an overwhelming lack of organized seminars, workshops, and routine breast health awareness campaigns, indicating systemic neglect within post-secondary educational institutions. Although some medical centers existed at certain universities, participants described them as less equipped to address women's health issues and were dominated by male healthcare providers, reflecting how environmental conditions can suppress SCT-modeled behavior changes. The discomfort students experienced in seeking care from male practitioners for concerns such as breast pain or lumps underscores the need for female practitioners and gender-sensitive healthcare. The gap between university administrators' claims of sufficient health service frameworks and students' lived experiences underscores the strong gap between institutional claims and actual outcomes.

This detachment reflects general critiques of the public health system in Bangladesh. Additionally, the absence of trained counsellors and the lack of self-help services tailored to students leaves female learners unattended, amplifying the impact of stigma and silence associated with breast health. The study participants supported actively initiatives like "Girls' Help Desks," regular health sessions, and inclusion of breast cancer awareness into the school syllabus.

Conclusion

This study highlights the awareness and attitudes of university students in Bangladesh regarding risk factors associated with breast cancer. This study found that a dominant number of female university students in the country had limited knowledge about breast cancer, which stemmed more from personal or familial experiences than academic pursuits. Most women actively sought knowledge only because of emotional triggers, many of which are based on false information from unreliable sources. Widespread belief in breast cancer associated with tight clothing or extramarital relations is a clear indication of inadequate health literacy. Cultural factors, including silence, shame, and fear, inhibited not only communication, but also self-breast examination and health-seeking behaviors. The findings of this study also indicate that there is a mix of accurate medical information and misconceptions regarding the risk factors of breast cancer among university students. A handful of participants demonstrated an understanding of

scientifically accepted risks, such as genetic factors, hormonal imbalances, and use of certain makeup products, while the majority embraced unscientific culturally based theories that undermined informed choices. Moreover, the findings of this study underscore the inadequate institutional response to breast cancer awareness in university settings. The absence of targeted seminars, health information campaigns, and accessible information on breast cancer reflects the systemic neglect of women's preventive health needs. In most universities, there are no medical centers, and where these centers exist, they are grossly understaffed and incapable of providing adequate care for female students, especially in gender-sensitive matters, such as breast cancer. Moreover, these medical centers are male-dominated, making them seem unapproachable and unresponsive to female students concerning essential accurate information about preventive measures such as Breast Self-Examination (BSE). The lack of female healthcare practitioners, coupled with sociocultural reluctance to discuss breast health with male doctors, makes seeking medical care nearly impossible.

Addressing this requires a student-centered, gender-sensitive health infrastructure that prioritizes monthly awareness programs, confidential counseling, and access to trained female professionals. However, a few encouraging cases of proactive behavior suggest that targeted education and open family discussions, especially in healthcare-aware households, can foster positive changes. These insights underscore the urgent need for accessible evidence-based awareness programs that not only inform but also challenge stigma, build confidence, and normalize breast health conversations among young women in Bangladesh. Finally, the study highlights a strong collective voice among participants, advocating systemic, educational, and cultural reforms to improve breast cancer awareness. This study emphasized the need to introduce accurate breast health information in the school curriculum, conduct university-based seminars led by female professionals, and establish safe, student-friendly medical support systems such as "Girls' Help Desks,." Participants also called for culturally appropriate awareness campaigns in rural areas, where misinformation and silence are deeply entrenched. A recurring recommendation was to normalize breast health conversations through the media, workshops, and peer discussions, challenging the stigma surrounding the topic. Importantly, participants stressed the inclusion of men in awareness efforts, given their role in family decision-making, while calling for gender-sensitive approaches that respected women's privacy. Collectively, these strategic recommendations point toward the need for a holistic, inclusive, and culturally rooted approach to build a more informed, empowered, and supportive environment for women's breast health in Bangladesh.

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