

Knowledge, Attitude and Practice Regarding Breast Self-Examination Among Adolescent Girls: A Comprehensive Review of Educational Interventions and Future Directions

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Abstract

Background: Breast cancer is the most frequently diagnosed cancer among women worldwide and remains one of the leading causes of cancer-related mortality. Although breast cancer predominantly affects adult women, awareness and preventive health behaviours should begin during adolescence. Breast Self-Examination (BSE) is a simple, inexpensive, and non-invasive method that helps women become familiar with the normal appearance and feel of their breasts, thereby facilitating the early recognition of abnormal changes. Despite increasing awareness campaigns, studies consistently report inadequate knowledge, negative attitudes, and poor BSE practices among adolescent girls, particularly in low- and middle-income countries.

Objective: This review aims to synthesize the existing evidence on knowledge, attitude, and practice regarding breast self-examination among adolescent girls and to evaluate the effectiveness of educational interventions designed to improve breast health awareness and promote regular BSE practice.

Methods: A comprehensive narrative review was conducted using published literature retrieved from PubMed, Scopus, Google Scholar, Web of Science, CINAHL, and WHO resources. Peer-reviewed articles published in English between 2015 and 2026 were considered. Studies focusing on adolescent girls aged 10–19 years that assessed knowledge, attitude, practice, barriers, or educational interventions related to breast self-examination were included.

Results: The reviewed literature indicates that the majority of adolescent girls possess inadequate knowledge regarding breast cancer risk factors, warning signs, and the correct technique of breast self-examination. Regular BSE practice remains low due to insufficient health education, cultural beliefs, fear of cancer diagnosis, misconceptions, embarrassment, and limited access to reliable health information. School-based educational programs, structured teaching modules, peer education, multimedia learning, and digital health interventions have consistently demonstrated significant improvements in knowledge, attitude, self-confidence, and BSE practice.

Conclusion: The evidence suggests that educational interventions are highly effective in improving breast health awareness and promoting breast self-examination among adolescent girls. Integrating breast health education into school curricula and community health programs can foster lifelong preventive health behaviours and contribute to earlier detection of breast abnormalities.

Keywords: Breast Self-Examination, Breast Cancer, Adolescent Girls, Knowledge, Attitude, Practice, Health Education, Nursing, Early Detection.

1. Introduction

Breast cancer has emerged as one of the most significant public health challenges worldwide. According to the Global Cancer Observatory (GLOBOCAN), breast cancer surpassed lung cancer as the most commonly diagnosed cancer globally, accounting for more than 2.3 million new cases annually. It continues to represent a substantial cause of morbidity and mortality among women despite remarkable advances in diagnosis and treatment.

Early detection remains one of the most effective strategies for reducing breast cancer-related mortality. Screening approaches such as mammography, clinical breast examination (CBE), and breast self-examination (BSE) play an important role in identifying abnormalities at an earlier stage. While mammography is considered the gold standard for population screening among older women, it is generally not recommended for adolescents because of dense breast tissue and extremely low disease prevalence. Therefore, breast self-awareness and proper education regarding breast self-examination become particularly important during adolescence.

Breast Self-Examination is a simple, cost-effective, non-invasive, and self-directed method that encourages women to become familiar with the normal appearance and feel of their breasts. Although BSE alone is not considered a substitute for mammography or clinical screening, it promotes breast awareness and may facilitate the earlier recognition of unusual changes that require medical evaluation.

Adolescence represents a critical developmental period during which lifelong health-related behaviors are established. Providing accurate breast health education during this stage may contribute to improved awareness, positive attitudes toward preventive healthcare, and greater confidence in recognizing abnormal breast changes in adulthood.

Despite numerous awareness campaigns worldwide, multiple studies have reported that adolescent girls demonstrate inadequate knowledge regarding breast cancer and poor adherence to regular breast self-examination practices. Several barriers—including cultural taboos, embarrassment, misconceptions, fear of cancer diagnosis, lack of educational opportunities, and limited access to accurate health information—continue to impede effective breast health promotion.

Healthcare professionals, particularly nurses, play a central role in educating adolescents about breast health. School-based health education programs, structured teaching modules, peer-led interventions, digital learning platforms, and community awareness initiatives have shown promising outcomes in improving knowledge, attitude, and breast self-examination practices among adolescent girls.

2. Objectives of the Review

General Objective

To critically review the existing literature on knowledge, attitude, and practice regarding breast self-examination (BSE) among adolescent girls and evaluate the effectiveness of educational interventions in improving breast health awareness.

Specific Objectives

1. To review the current level of knowledge regarding breast self-examination among adolescent girls.
2. To assess adolescents' attitudes toward breast self-examination and breast cancer prevention.
3. To evaluate the reported practice of breast self-examination among adolescent girls.

4. To identify barriers affecting regular breast self-examination practice.
5. To examine the effectiveness of educational interventions in improving knowledge, attitude, and practice.
6. To identify research gaps and recommend future directions for nursing education and public health.

3. Methodology

Design

This review was conducted as a narrative literature review to summarize and critically analyze published evidence regarding breast self-examination among adolescent girls.

Search Strategy

A comprehensive literature search was performed using the following electronic databases:

- PubMed
- Scopus
- Google Scholar
- CINAHL
- Web of Science
- ScienceDirect
- WHO publications

The search covered studies published between January 2015 and June 2026.

Search Keywords

The following Medical Subject Headings (MeSH) and keywords were combined using Boolean operators:

- Breast Self-Examination
- Breast Cancer Awareness
- Knowledge
- Attitude
- Practice
- Adolescent Girls
- School Students
- Nursing Education
- Health Education
- Breast Health Promotion

Example search string:

("Breast Self-Examination" OR "BSE") AND ("Knowledge" OR "Awareness") AND ("Attitude") AND ("Practice") AND ("Adolescent Girls" OR "School Students")

Inclusion Criteria

Studies were included if they:

- Were published in English.
- Were published between 2015 and 2026.
- Included adolescent girls aged 10–19 years.
- Assessed knowledge, attitude, practice, barriers, or educational interventions related to BSE.
- Were peer-reviewed original research, quasi-experimental studies, cross-sectional studies, or systematic reviews.

Exclusion Criteria

- The following studies were excluded:
- Studies involving only adult women.
- Editorials, conference abstracts without full text, letters, and commentaries.
- Studies not related to breast self-examination.
- Duplicate publications.

Data Extraction

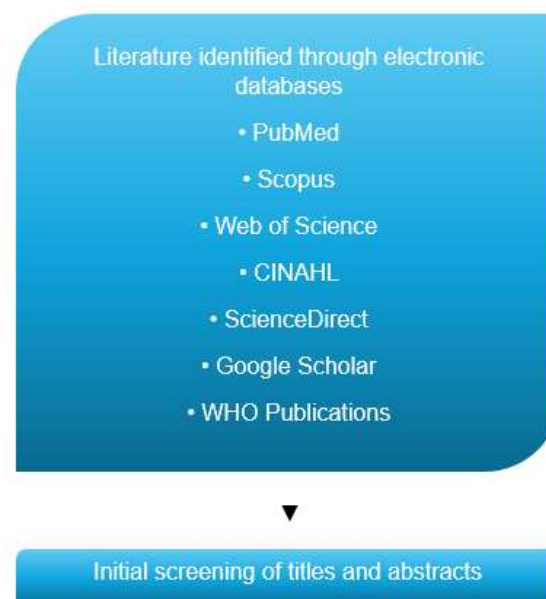
Information extracted from each study included:

- Author
- Year
- Country
- Study design
- Sample size
- Population characteristics
- Major findings
- Educational intervention (if applicable)
- Key conclusions

Quality Appraisal

Preference was given to studies published in peer-reviewed journals indexed in PubMed, Scopus, Web of Science, and reputable international publishers. Methodological quality, sample size, study design, and relevance to the review objectives were considered during evidence synthesis.

The study selection process was conducted systematically to identify relevant literature for this review. Records retrieved from the selected electronic databases were screened based on predefined inclusion and exclusion criteria. Duplicate records and studies that did not meet the eligibility criteria were excluded, and the remaining full-text articles were assessed for inclusion. The overall study selection process is illustrated in Figure 1.



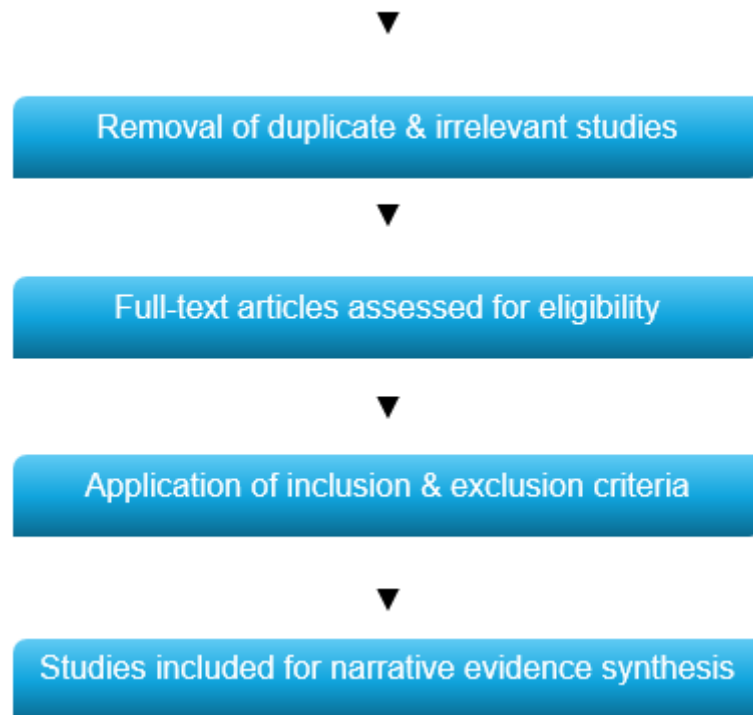


Figure 1. Literature Search and Study Selection Process

4. Need for the Review

Breast cancer continues to be a significant global public health concern, with increasing incidence reported in both developed and developing countries. Although breast cancer is uncommon during adolescence, this period represents a crucial stage for developing lifelong health-promoting behaviors.

Evidence suggests that breast self-examination awareness among adolescent girls remains inadequate despite continuous public health campaigns. Many adolescents lack appropriate knowledge regarding breast anatomy, warning signs of breast cancer, and the correct technique and timing of breast self-examination. Consequently, misconceptions and fear frequently discourage young females from practicing BSE.

Educational institutions provide an ideal platform for introducing structured breast health education. Nurses, teachers, and community health professionals can significantly influence adolescents' knowledge, attitudes, and preventive health behaviors through planned educational interventions.

Although numerous studies have examined knowledge, attitude, and practice regarding breast self-examination in different populations, findings among adolescent girls remain fragmented. Furthermore, variations in educational strategies and cultural contexts necessitate a comprehensive synthesis of available evidence.

This review therefore aims to consolidate current literature, identify common barriers, evaluate educational interventions, and highlight research gaps that may guide future nursing education, school health programs, and public health policy.

5. Review of Literature

5.1 Global Burden of Breast Cancer

Breast cancer is the most commonly diagnosed cancer among women worldwide and remains a leading

cause of cancer-related mortality. According to the International Agency for Research on Cancer (IARC), approximately 2.3 million new cases of breast cancer were diagnosed globally in 2022, accounting for nearly one in four cancers among women. Despite advances in screening, diagnosis, and treatment, breast cancer continues to impose a substantial burden on healthcare systems, particularly in low- and middle-income countries where late-stage diagnosis and limited access to healthcare services contribute to poorer outcomes.

In India, breast cancer has overtaken cervical cancer as the most frequently diagnosed cancer among women. Urbanization, changing reproductive patterns, sedentary lifestyles, obesity, delayed childbearing, and increasing life expectancy have all contributed to the rising incidence. While breast cancer predominantly affects women over 40 years of age, promoting breast health awareness during adolescence can establish lifelong preventive health behaviours that facilitate early recognition of breast abnormalities. Early detection remains one of the most effective strategies for improving survival. Although mammography is the standard screening tool for older women, breast self-awareness and breast self-examination serve as valuable educational approaches for younger females who are generally not eligible for routine mammographic screening.

5.2 Breast Self-Examination: Concept and Importance

Breast Self-Examination (BSE) is a systematic method by which women examine their own breasts to detect unusual changes such as lumps, skin dimpling, nipple discharge, or alterations in breast shape. Traditionally, women have been encouraged to perform BSE once every month, preferably a few days after menstruation when hormonal influences on breast tissue are minimal. For women who no longer menstruate, selecting the same calendar day each month is commonly recommended.

Although organizations such as the World Health Organization and the American Cancer Society emphasize that BSE should not replace evidence-based screening methods such as mammography, they strongly support breast self-awareness. Familiarity with the normal appearance and feel of the breasts enables women to recognize changes promptly and seek timely medical evaluation.

For adolescents, the primary objective of teaching BSE is educational rather than diagnostic. Introducing breast health education during adolescence helps normalize discussions about breast health, reduces misconceptions, enhances confidence in self-care, and encourages positive health-seeking behaviours that may continue throughout adulthood.

Nurses, school health professionals, and community health workers play a crucial role in teaching the correct technique of BSE through demonstrations, audiovisual materials, and structured educational sessions. Effective instruction not only improves technical knowledge but also fosters a positive attitude toward preventive healthcare.

5.3 Knowledge Regarding Breast Self-Examination Among Adolescent Girls

Knowledge forms the foundation of preventive health behaviour. The literature consistently demonstrates that adolescent girls possess limited knowledge regarding breast anatomy, breast cancer risk factors, warning signs, and the correct method of performing breast self-examination.

Studies conducted across Asia, Africa, and the Middle East indicate that many adolescents are unaware of the recommended timing, frequency, and technique of BSE. Awareness is generally higher among students enrolled in health-related disciplines than among those in general education streams. However, even among healthcare students, knowledge gaps regarding proper examination techniques and the importance of regular practice have been reported.

Several factors influence knowledge levels, including educational status, parental education, socioeconomic background, exposure to health information, internet access, previous participation in awareness programmes, and interaction with healthcare professionals. Adolescents who receive structured health education in schools consistently demonstrate higher knowledge scores than those without formal instruction.

In India, studies have highlighted inadequate awareness of breast cancer symptoms and preventive measures among school-going girls, particularly in rural areas. Cultural sensitivity surrounding discussions of breast health, limited school-based health education, and inadequate access to reliable information continue to hinder knowledge acquisition. These findings underscore the need for integrating comprehensive breast health education into adolescent health programmes.

5.4 Attitude Towards Breast Self-Examination Among Adolescent Girls

Attitude is a key determinant of preventive health behaviour. A positive attitude towards breast self-examination (BSE) encourages adolescents to adopt regular breast health practices, whereas fear, misconceptions, embarrassment, and cultural beliefs often discourage participation. Research consistently shows that although many adolescent girls recognize the importance of early detection of breast cancer, only a small proportion express confidence in performing BSE correctly or intend to practice it regularly. Several studies have identified factors associated with positive attitudes toward BSE, including higher educational level, previous exposure to breast health education, family support, access to reliable health information, and interaction with healthcare professionals. Adolescents who receive structured educational sessions are more likely to perceive BSE as a useful preventive health behaviour and report greater confidence in identifying breast changes. Educational interventions have been shown to improve knowledge, reduce anxiety, and promote favourable attitudes toward breast health.

Conversely, negative attitudes are frequently linked to myths regarding breast cancer, fear of discovering a lump, embarrassment about touching one's breasts, and the misconception that breast cancer affects only older women. Cultural norms that discourage discussions about breast health further contribute to reluctance among adolescent girls. A recent Indian study also reported that shyness and limited family discussion about breast health were associated with unfavourable attitudes toward BSE.

Overall, the literature indicates that attitude can be positively modified through well-designed educational programmes, highlighting the essential role of nurses, teachers, and school health services in promoting breast health awareness.

5.5 Practice of Breast Self-Examination Among Adolescent Girls

Although awareness of breast cancer has improved in many countries, regular practice of breast self-examination among adolescent girls remains consistently low. Most studies report that only a minority of adolescents perform BSE monthly, while many have either never attempted the procedure or perform it incorrectly.

The gap between knowledge and practice reflects the influence of multiple behavioural and environmental factors. Adolescents who have participated in structured health education programmes demonstrate significantly higher rates of BSE practice compared with those who have not received formal instruction. Interactive educational approaches—including demonstrations, peer learning, audiovisual materials, and supervised practice—have been particularly effective in improving both confidence and regular BSE performance.

The literature also suggests that repeated reinforcement is essential. A single educational session may improve immediate knowledge, but periodic follow-up, reminders, and practical demonstrations are more

likely to sustain long-term practice. School-based programmes provide an ideal setting for reinforcing these behaviours during adolescence.

Despite these improvements, the overall prevalence of regular BSE practice remains unsatisfactory in many low- and middle-income countries. This highlights the need for continuous educational efforts and the integration of breast health promotion into school health programmes and community-based nursing services.

5.6 Barriers to Breast Self-Examination Practice

The literature identifies several barriers that limit the adoption of regular breast self-examination among adolescent girls. These barriers can be broadly categorized as educational, psychological, cultural, social, and healthcare-related.

One of the most common barriers is inadequate knowledge regarding the correct technique, timing, and purpose of BSE. Many adolescents are unaware of when or how to perform the examination, leading to uncertainty and reduced confidence. Fear of detecting an abnormality, anxiety about a possible cancer diagnosis, and misconceptions regarding breast cancer further discourage regular practice.

Cultural beliefs also play a significant role. In many societies, discussions about breast health are considered sensitive or inappropriate, preventing adolescents from seeking accurate information. Feelings of embarrassment, modesty, and social stigma often discourage girls from discussing breast-related concerns with parents, teachers, or healthcare professionals. Inadequate communication within families and limited access to adolescent-friendly health education further contribute to poor awareness.

Health system barriers include limited availability of structured breast health education, lack of trained school health personnel, and insufficient emphasis on breast health within school curricula. Socioeconomic disparities, unequal access to digital health resources, and differences between urban and rural settings also influence awareness and practice.

Recent reviews emphasize that overcoming these barriers requires culturally sensitive educational strategies, active involvement of nurses and teachers, family engagement, and sustained school-based health promotion programmes. Integrating breast health education into existing adolescent health initiatives may substantially improve awareness and encourage lifelong preventive health behaviours.

5.7 Effectiveness of Educational Interventions on Breast Self-Examination Among Adolescent Girls

Health education is one of the most effective strategies for improving breast self-examination (BSE) knowledge, attitudes, and practices among adolescent girls. The literature consistently demonstrates that structured educational interventions significantly enhance breast health awareness, increase confidence in performing BSE, and promote regular self-examination. Nurses, school teachers, public health professionals, and community health workers play pivotal roles in delivering these interventions.

Planned Teaching Programme (PTP)

Several quasi-experimental studies have reported that planned teaching programmes significantly improve adolescents' knowledge and understanding of breast cancer and BSE. These programmes typically include lectures, demonstrations, interactive discussions, and printed educational materials. Pre-test and post-test evaluations consistently show statistically significant improvements in knowledge and positive attitudes after the intervention.

The effectiveness of planned teaching programmes is attributed to their systematic approach, which allows participants to acquire theoretical knowledge alongside practical skills. These programmes are particularly effective when reinforced through periodic follow-up sessions.

Structured Teaching Modules (STM)

Structured teaching modules provide standardized educational content using evidence-based information. They usually combine PowerPoint presentations, videos, breast models, demonstrations, and supervised return demonstrations.

Studies indicate that structured teaching modules improve not only theoretical knowledge but also adolescents' confidence in performing BSE correctly. The use of visual aids and practical demonstrations enhances comprehension and long-term retention compared with traditional lecture-based methods.

Because structured teaching modules can be easily integrated into school health programmes, they represent a sustainable strategy for breast health promotion.

Video-Assisted Learning

The increasing availability of digital technology has expanded opportunities for video-assisted health education. Educational videos provide step-by-step demonstrations of BSE techniques and allow learners to review the material multiple times.

Research suggests that video-assisted teaching significantly improves learners' understanding of breast anatomy, examination techniques, and early warning signs of breast abnormalities. Adolescents often report greater satisfaction and engagement with multimedia learning compared with conventional classroom lectures.

Digital videos also reduce dependence on instructor availability and provide consistent educational content across different settings.

Peer Education

Peer education has emerged as an effective approach for adolescent health promotion. In this model, trained students educate their classmates regarding breast health and BSE practices.

Studies demonstrate that adolescents are often more comfortable discussing sensitive health topics with peers than with adults. Peer-led programmes encourage open communication, reduce embarrassment, and improve participation in breast health education activities.

Furthermore, peer education fosters leadership skills, teamwork, and sustained dissemination of health information within schools and communities.

Mobile Health (mHealth) and Digital Education

Recent advances in mobile technology have introduced innovative methods for breast health education. Smartphone applications, online learning platforms, social media campaigns, and reminder systems have shown promising results in improving breast cancer awareness among adolescents.

Digital interventions offer several advantages, including flexibility, accessibility, and cost-effectiveness. Reminder notifications encourage regular BSE practice, while interactive applications provide instructional videos, quizzes, and self-assessment tools that reinforce learning.

The increasing use of smartphones among adolescents makes digital education an attractive strategy for future breast health promotion programmes.

Nurse-Led School Health Education

Nurses play a central role in promoting adolescent breast health through school- and community-based educational programmes. Their expertise enables them to provide accurate information, demonstrate correct BSE techniques, address misconceptions, and offer psychological support.

Evidence indicates that nurse-led interventions significantly improve knowledge, attitudes, and BSE practice among adolescent girls. In addition to education, nurses can identify learning needs, provide

counselling, involve parents and teachers, and advocate for the inclusion of breast health education in school curricula.

Strengthening the role of nurses in adolescent health promotion may contribute to long-term improvements in breast cancer awareness and early detection behaviours.

Summary of Evidence

Across diverse educational settings and cultural contexts, the literature consistently demonstrates that educational interventions are effective in improving breast self-examination knowledge, attitudes, and practices among adolescent girls. Although the type of intervention varies, programmes incorporating interactive teaching methods, demonstrations, audiovisual materials, and repeated reinforcement generally produce the most favourable outcomes.

Despite these positive findings, several studies highlight the need for sustained educational efforts, regular reinforcement, and culturally appropriate teaching strategies to ensure long-term behavioural change. Integrating breast health education into routine school health programmes and strengthening the involvement of nursing professionals are likely to enhance the effectiveness and sustainability of these interventions.

5.8 Research Gaps

Although substantial research has examined breast self-examination among women, studies specifically involving adolescent girls remain comparatively limited, particularly in rural and resource-constrained settings. Most available studies use cross-sectional designs, which assess knowledge and practices at a single point in time and do not determine whether educational interventions have lasting effects.

Another important limitation is the lack of standardized educational programmes across studies. Different researchers have used varied teaching methods, assessment tools, and outcome measures, making direct comparison difficult. Long-term follow-up is also rarely conducted, so there is limited evidence on whether improvements in knowledge and BSE practice are sustained over time.

Few studies have explored the use of artificial intelligence, mobile health applications, gamification, or social media-based educational interventions for promoting breast health among adolescents. In addition, parental involvement, teachers' roles, and culturally tailored educational approaches remain underexplored, especially in rural Indian settings.

Future research should focus on multicentre longitudinal studies with larger sample sizes, standardized educational interventions, and long-term follow-up. There is also a need to evaluate technology-assisted learning, school-based breast health programmes, and community-driven awareness initiatives. Such research will provide stronger evidence to guide nursing education, public health policy, and adolescent health promotion.

Based on the evidence synthesized in the reviewed literature, a conceptual framework was developed to illustrate the relationship between educational interventions and breast self-examination (BSE) practices among adolescent girls. The framework demonstrates how structured educational strategies improve knowledge, foster positive attitudes, promote regular BSE practice, and ultimately contribute to early recognition of breast abnormalities and improved breast health outcomes.



Figure 2. Conceptual Framework of Educational Interventions Influencing Breast Self-Examination Among Adolescent Girls

6. Discussion

This review synthesized current evidence on the knowledge, attitude, and practice (KAP) regarding breast self-examination (BSE) among adolescent girls, with particular emphasis on the effectiveness of educational interventions. The findings consistently indicate that adolescent girls demonstrate inadequate knowledge of breast cancer risk factors, warning signs, and correct BSE techniques. Similar observations have been reported across both developed and developing countries, suggesting that insufficient breast health awareness is a global public health concern.

Knowledge is the first step toward preventive health behaviour. The literature reviewed indicates that adolescents who receive structured health education possess significantly better knowledge regarding breast anatomy, the importance of early detection, and the appropriate method and timing of BSE. However, awareness alone does not necessarily translate into regular practice. Many studies reported a considerable gap between knowledge and actual BSE performance, highlighting the influence of behavioural, psychological, and sociocultural factors.

Attitude emerged as another important determinant of BSE practice. Although many adolescent girls acknowledged the benefits of early detection, fear of discovering a breast lump, embarrassment, misconceptions about breast cancer, and cultural taboos often discouraged regular self-examination. These findings suggest that educational programmes should not only provide factual information but also address emotional barriers, improve self-confidence, and promote positive health beliefs.

Regular practice of BSE among adolescent girls remains unsatisfactory worldwide. The literature consistently shows that only a minority perform monthly examinations, even among those with adequate knowledge. This discrepancy may be explained by limited practical training, absence of reinforcement, lack of confidence, and inadequate motivation. Educational interventions that include demonstrations, supervised practice, and periodic follow-up appear more effective in translating knowledge into sustained behavioural change than traditional lecture-based teaching alone.

The review further demonstrates that educational interventions—including planned teaching programmes, structured teaching modules, nurse-led education, peer learning, and digital health approaches—significantly improve knowledge, attitude, and practice. Interactive teaching methods involving audiovisual aids, breast models, group discussions, and return demonstrations consistently produce better learning outcomes than passive educational strategies. Recent digital innovations, including smartphone applications, online learning platforms, and reminder systems, also show promising potential for increasing adolescent engagement and encouraging regular BSE practice.

From a nursing perspective, these findings reinforce the pivotal role of nurses in adolescent health promotion. Nurses are uniquely positioned to provide culturally appropriate education, demonstrate correct BSE techniques, counsel adolescents, and collaborate with schools and families to establish sustainable breast health programmes. Integrating breast health education into school health services can promote lifelong preventive behaviours and contribute to earlier recognition of breast abnormalities.

Despite encouraging evidence, several limitations were identified in the available literature. Most studies employed cross-sectional designs and assessed outcomes immediately after educational interventions, with limited long-term follow-up. Variations in assessment tools, educational methods, and outcome measures also limit direct comparison across studies. Furthermore, relatively few studies have evaluated the long-term effectiveness of technology-assisted learning or culturally tailored interventions in rural populations.

Overall, the evidence indicates that comprehensive educational interventions significantly enhance breast self-examination knowledge, foster positive attitudes, and improve BSE practice among adolescent girls. However, sustained reinforcement, school-based implementation, parental involvement, and continued nursing support are essential to ensure long-term behavioural change and improved breast health awareness.

7. Nursing Implications

The findings of this review have several important implications for nursing education, clinical practice, community health, and public health policy.

Nursing professionals should actively incorporate breast health education into adolescent health promotion programmes. School health nurses can conduct regular awareness sessions, practical demonstrations, and counselling to improve knowledge and confidence regarding breast self-examination.

Nurse educators should integrate breast cancer awareness and BSE training into undergraduate nursing curricula, ensuring that future nurses are equipped to educate communities effectively.

Community health nurses can organize outreach programmes in rural and underserved areas where awareness remains particularly low. Collaboration with schools, parents, local health authorities, and non-governmental organizations can facilitate wider dissemination of breast health information.

Digital technologies such as mobile applications, educational videos, and social media campaigns should be incorporated into nursing practice to enhance accessibility and engagement among adolescents. Technology-assisted learning may complement traditional educational methods and improve long-term retention of knowledge.

Finally, nursing administrators and policymakers should advocate for the inclusion of breast health education within national school health programmes to promote preventive healthcare from adolescence onwards.

8. Recommendations

1. Based on the findings of this review, the following recommendations are proposed:
2. Integrate structured breast health education into secondary school curricula.
3. Conduct regular nurse-led awareness programmes focusing on breast self-examination among adolescent girls.
4. Utilize innovative educational approaches, including videos, mobile applications, simulation models, and peer education.
5. Encourage active participation of parents and teachers in promoting breast health awareness.
6. Develop culturally appropriate educational materials suitable for rural and urban populations.
7. Establish periodic reinforcement sessions to encourage regular breast self-examination practice.
8. Promote multicentre longitudinal studies evaluating long-term effectiveness of educational interventions.
9. Explore the use of artificial intelligence, mobile health technologies, and digital learning platforms in adolescent breast health education.
10. Standardize educational interventions and outcome measures to facilitate comparison across future studies.
11. Strengthen collaboration between nursing institutions, schools, and public health agencies to ensure sustainable breast health promotion programmes.

9. Conclusion

Breast cancer remains one of the leading causes of morbidity and mortality among women worldwide, making early awareness and preventive health practices essential. Although breast cancer is uncommon during adolescence, this developmental stage offers a valuable opportunity to establish lifelong health-promoting behaviours. The evidence reviewed in this paper indicates that most adolescent girls have insufficient knowledge regarding breast cancer and breast self-examination (BSE), accompanied by poor attitudes and infrequent practice.

Educational interventions—including planned teaching programmes, structured teaching modules, nurse-led education, peer-assisted learning, and digital health approaches—have consistently demonstrated significant improvements in knowledge, attitude, confidence, and BSE practice. However, the sustainability of these improvements depends on regular reinforcement, culturally sensitive teaching strategies, and integration of breast health education into school and community health programmes.

Nurses play a crucial role in promoting breast health awareness through education, counselling, demonstration, and advocacy. Collaboration among schools, healthcare professionals, parents, and policymakers is essential to create supportive environments that encourage adolescents to adopt preventive health behaviours.

Future research should focus on multicentre longitudinal studies, standardized educational interventions, and innovative digital learning strategies to strengthen the evidence base. Promoting breast health awareness during adolescence has the potential to improve early recognition of breast abnormalities, encourage timely healthcare-seeking behaviour, and contribute to reducing the long-term burden of breast cancer.

Table 1. Characteristics of Studies Included in the Review

Author (Year)	Country	Study Design	Population	Main Findings
Sumathi & Jose (2024)	India	Pre-experimental	Nursing students	Planned teaching programme significantly improved knowledge regarding BSE.
Sharan dip Kaur & Jaspal Kaur (2024)	India	One-group pre-test/post-test	Rural adolescent school girls	Structured teaching programme significantly improved BSE knowledge.
Sivagami & Padihar (2024)	India	Quasi-experimental	Female secondary school students	Educational intervention improved knowledge, attitudes, and BSE practice.

Nigerian adolescent school study (reviewed in systematic review, 2025)	Nigeria	Quasi-experimental	280 adolescent girls	Health education significantly improved knowledge, attitude, and practice of BSE.
Semi-urban Dhaka school study (2025)	Bangladesh	Cross-sectional	384 adolescent school girls	Awareness of BSE was low and only a small proportion practiced BSE regularly.
Salsabila et al. (2025)	Indonesia	Quasi-experimental	Adolescent girls	Peer education significantly improved knowledge and attitudes toward BSE.
Nurianti & Batubara (2025)	Indonesia	Educational intervention	Junior high school students	Health promotion using leaflets and animated videos improved BSE knowledge.
Comprehensive Review (2025)	International	Narrative review	Adolescent girls	School-based, nurse-led, peer, and digital interventions consistently improved KAP regarding BSE.
Systematic Review of School-Level Students (2025)	Global	Systematic review	School students	Knowledge of breast cancer and BSE remained inadequate; curriculum-based education was recommended.
SSA Review Protocol (2024)	Sub-Saharan Africa	Systematic review protocol	Adolescent girls	Identified need for culturally appropriate BSE education programmes and stronger

				implementation evidence.
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