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Effectiveness of a Structured Teaching Programme on Knowledge of Breast Self-Examination Among Rural Women

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ABSTRACT

Breast self-examination (BSE) is among the cheapest early-detection measures available, and structured teaching programmes delivered by nurses are the usual way of introducing it to women in rural areas where mammography is out of reach. Evaluations of such programmes most often report a gain in knowledge shortly after the session. This narrative review asks what that finding is worth. It draws on published work on the two large randomised trials of BSE, on the shift in guidance from routine BSE towards breast awareness, on delay in presentation and survival, on rural barriers and health literacy, on the behavioural theory that teaching programmes borrow, and on the design of programme evaluations. It reports no data from any village, clinic or participant. The trial evidence does not show that teaching BSE lowers breast cancer mortality, and it points to more benign biopsies, so the case for programmes rests on earlier presentation and informed choice, not on proven survival benefit. A short-term knowledge gain is plausible and easy to measure, but it is a weak guide to lasting practice, to correct technique, or to prompt attendance for a lump. Typical weaknesses of evaluations include single-group before-and-after designs, unvalidated knowledge tests, self-reported practice and short follow-up. The review sets out what a credible evaluation would measure and what rural programmes should promise women.

Keywords: Breast self-examination; Breast awareness; Health education; Rural women; Nursing; Early detection; Narrative review

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Article Class: Narrative Review

1. Introduction

Breast cancer is the commonest cancer in women worldwide, and the share of the burden falling on lower- and middle-income countries has been rising

(1, 2). Where mammography is scarce, outcomes depend heavily on how far the disease has advanced by the time a woman reaches a clinic, and survival gaps between regions are wide (3, 4). Women in rural



areas meet the problem at its sharpest: services are far away, travel costs money and the first person consulted is often not a clinician (5, 6).

Breast self-examination (BSE), in which a woman looks at and feels her own breasts by a taught routine, has been a favourite answer to this problem because it costs almost nothing (7, 8). Nursing teaching programmes, usually a structured session with a demonstration on a model, are the commonest way of introducing it. The usual evaluation asks women a set of questions before the session and again soon afterwards. A rise in the score is easy to show; whether it matters is a different question. A gain on a test given an hour after the session is a start, not a result.

This review looks at what the published literature says about the effectiveness of structured teaching programmes on BSE for rural women. The title may suggest a local study, so it should be said plainly that no data from any village, clinic or participant are reported here. The review is about the topic as it appears in the literature, and it is a narrative review, not a trial. The aim is to separate what has been shown from what has simply been repeated in teaching manuals.

2. Literature Review

2.1 Breast Self-Examination and the Question of Benefit

The strongest evidence on BSE comes from two large randomised trials, one among factory workers in Shanghai and one in Russia, both reviewed by the Cochrane Collaboration (9, 10, 11). In Shanghai, more than a quarter of a million women took part, and the intervention was unusually intense, with repeated teaching and reinforcement. The women who were taught did not die less often from breast cancer, but they did undergo more biopsies for lesions that proved benign (11). Pooled

observational and trial data led to a similar message: the evidence was not enough to claim a mortality benefit (12). Table 1 lists the main sources.

Two points of interpretation deserve emphasis. First, the trials tested a package of teaching and reinforcement, not a woman's unaided effort, so they say little about a single demonstration session, which is what most rural programmes can afford. Second, the extra biopsies are not a trivial matter: each means a visit, a procedure, cost and anxiety, burdens that fall hardest on women who live far from a hospital (9, 12). A programme that pushes BSE without a way of handling the lumps that women then find may create work that the local service cannot absorb.

Table 1. Principal sources on breast self-examination and related early-detection approaches.

Source	Design	Main message
Shanghai trial (10, 11)	Randomised, factory workers, intensive BSE teaching	No lower breast cancer mortality; more benign biopsies
Cochrane review (9)	Review of the two randomised BSE trials	No mortality benefit; harms from extra biopsies
Meta-analysis (12)	Pooled observational and trial studies	Evidence too weak to support routine teaching
Clinical breast examination trials (13, 14, 15)	Cluster-randomised and screening studies in India and the Philippines	Feasible in low-resource settings; outcomes still being established
Guidance (8, 16)	Guideline and evidence review	BSE optional or discouraged as routine; awareness stressed

Note: Qualitative summary of the cited sources. Numerical results are deliberately not reproduced.



Guidance moved accordingly. Where it once urged monthly BSE, the American Cancer Society update of 2003 treated it as an option, to be offered with an honest account of its benefits and limits (8), and the evidence review behind the 2009 United States task force recommendation was no more encouraging (16, 17). The word used instead is breast awareness: knowing what is normal for one's own breasts and seeking care promptly for a change. Even mammography, with far better trial support, is argued over, because its benefit must be set against overdiagnosis and false alarms (18, 19, 20, 21). Figure 3 places these works in time. That distinction sounds fussy until a ward has to decide what to teach a village.



Figure 3. Timeline of cited works that shaped the case for and against breast self-examination (schematic).

2.2 Why Early Presentation Matters Where Screening Is Scarce

The argument for teaching women in low-resource settings therefore rests less on BSE as a screening test and more on shortening delay. Systematic reviews have linked longer delay between first symptom and treatment with poorer survival, and have identified what predicts delay, among them lack of knowledge, fear and the belief that a painless lump is harmless (22, 23). Seen this way, the programme is one link

in a pathway that also needs a clinic at the other end. In Asian populations, breast cancer tends to present at a younger age and, in many series, at a later stage than in Western ones (24).

Resource-stratified guidelines from the Breast Health Global Initiative took that into account. They suggested that where mammography is out of reach, early detection programmes should start with awareness and prompt diagnosis, and add clinical breast examination as resources allow (6, 25). A widely read commentary put the principle as doing what you can with what you have, not copying high-income programmes (7). Clinical breast examination by trained health workers has since been tested in cluster trials in India and the Philippines, with the question of mortality still being worked out (13, 14, 15). Examination by a clinician has its own limits, as earlier reviews made clear (26).

What this implies for teaching is fairly specific. The content most worth conveying is not an elaborate palpation routine but a short list: that a new lump, a change in shape or skin, or a discharge from the nipple should prompt a visit; that pain is not a reliable guide to safety; and where to go (8, 23).

2.3 Rural Women, Barriers and Health Literacy

Rural health disparities have cultural as well as geographical roots: self-reliance, fatalism, distrust of formal care and a preference for local healers can shape what a woman does with a lump (5). A systematic review of barriers to early presentation among black women in high-income countries found fear, embarrassment and low knowledge recurring across studies (27). The setting differs from rural areas elsewhere, but the barriers seem familiar.



Health literacy adds another layer. It covers not only reading ability but the skills to find, understand and use information, and low literacy is associated with poorer health outcomes in general (28, 29). Cancer communication raises its own difficulties, because probabilities and screening trade-offs are hard to explain even to educated audiences (30). A teaching programme that relies on printed leaflets alone may miss the very women it is meant for.

Practical constraints matter as much as beliefs. A woman who works in the fields or cares for a household may have little private time, and a long journey to a facility means lost income as well as fare. Surveys of services in lower-income settings describe uneven access to diagnosis and treatment even once a woman does present, and survival differences between regions are a likely result (3, 4). Teaching that ignores this risks giving women a duty without the means to discharge it (6).

2.4 The Theory Behind Teaching Programmes

Most programmes borrow, usually without saying so, from the Health Belief Model. It proposes that a person acts when she feels susceptible to a threat, believes it serious, sees benefit in acting and perceives that the barriers are manageable (31, 32), and scales have been developed to measure these beliefs for breast examination (33). Confidence in one's own ability, or self-efficacy, is a second ingredient (34), which is why demonstration and practice on a model are central. Table 2 sets out how these constructs map onto elements of a typical programme.

Other frameworks add the idea that people move through stages of readiness, so one session reaches a woman at one stage and not another (35), and that behaviour change interventions can be designed by

examining capability, opportunity and motivation together (36). Messages tailored to the individual tend to work better than generic ones (37), and lay health workers can extend the reach of services into communities (38). Because BSE itself has unproven benefit, decision aids that explain uncertainty may suit it better than exhortation (39).

Table 2. Behavioural constructs and the teaching-programme elements that target them.

Construct	Meaning	Programme element
Perceived susceptibility (31, 32)	Belief that one could develop the disease	Plain account of who gets breast cancer
Perceived barriers (27, 33)	Fear, embarrassment, cost, distance	Private demonstration; local language
Perceived benefit (32)	Belief that early action helps	Honest message on earlier presentation
Self-efficacy (34)	Confidence in being able to do it	Hands-on practice on a model
Readiness to change (35)	Stage of willingness to act	Follow-up contact, not one session
Cue to action (36)	Prompt that triggers the behaviour	Reminders; link to a named clinic

Note: Constructs follow the Health Belief Model and social cognitive theory; the pairing with programme elements is the authors' reading.

3. Materials and Methods

3.1 Scope

The review asks what the published literature establishes about structured teaching programmes on BSE for rural women, and how firmly. It covers the evidence on BSE itself, the logic of education programmes, and the methods used to evaluate them.

3.2 Literature Assembly

This is a narrative synthesis. No formal systematic search was made, no database



list or search string is claimed, and no screening or quality scoring was done; the authors chose sources for relevance, influence and clarity of method, so the selection reflects judgement. Every work cited was published in or before 2014.

3.3 Appraisal Framework

To compare claims of different strength we sorted outcomes along the ladder in Figure 2, from knowledge scores at one end to mortality at the other, and noted for each how easy it is to measure and how much it can support. It is a blunt instrument, but it keeps the argument honest. Study designs were judged against reporting standards for randomised and non-randomised evaluations and against guidance on complex interventions (40, 41, 42).

	Easy to measure	Strength as evidence
Knowledge score	High	Weak
Attitude / confidence	High	Weak
Self-reported practice	High	Weak
Observed technique	Moderate	Moderate
Stage at diagnosis	Low	Strong
Mortality	Low	Strongest

qualitative grading by the authors; not data

Figure 2. Outcome levels an evaluation could report and what each can support (qualitative matrix, not data).

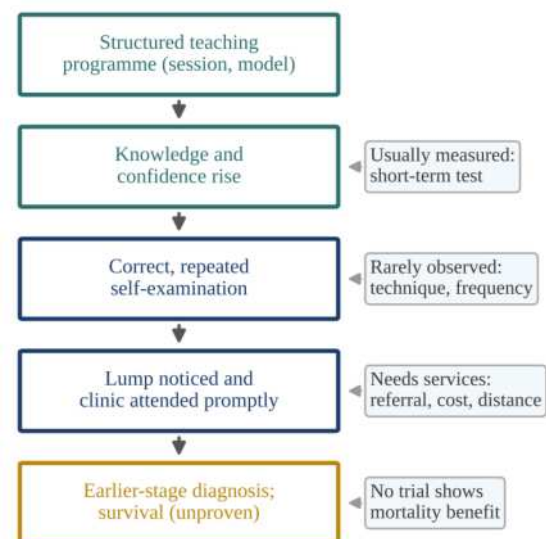
4. Results

4.1 What a Teaching Programme Can Plausibly Change

Reports of teaching programmes, and the theory behind them, make one result plausible: women who attend a well-run session will know more about breast cancer and about the steps of BSE

immediately afterwards, and will often feel more confident. That is a modest claim, and a believable one, given what is known about learning and self-efficacy (34, 37). It says little, though, about the questions that matter next: does she examine herself correctly, does she keep doing so, and does she go to a clinic when she finds something? Neither finding is an argument for silence; both are arguments for care in what is promised.

Figure 1 sets out the chain assumed by most programmes. It is a tidy chain, and each arrow in it is an assumption that someone has to check. Knowledge and confidence sit at the top and are the links that evaluations measure. The later links, technique, repetition and prompt attendance, are rarely observed and depend on things a session cannot supply: privacy, time, money for the journey and a clinician who will take the lump seriously (5, 23). A woman who finds a lump and cannot reach anyone who can examine it has been taught something, but not helped. Few studies look past it.



schematic, not data

Figure 1. Assumed chain from a teaching programme to outcomes, with the links that are least established (schematic, not data).



4.2 Does Practice Lead to Earlier Detection or Survival?

No trial has shown that teaching BSE lowers mortality, and the largest ones suggest more benign biopsies (9, 11). Whether teaching leads to women presenting earlier is a separate question that the trials were not designed to answer, and the delay literature suggests it is the more promising route (22). A programme that encouraged women to attend promptly with any change, and that was linked to a clinic able to respond, could in principle shorten delay. Evidence that this happens for programmes in rural areas is thin.

There is also the matter of what counts as success. If a programme leads more women to attend, and more of those women have benign findings, an evaluator who counts attendance alone will report a triumph while the clinic notes only a heavier workload. The opposite can occur: a programme that improves knowledge but frightens women may delay attendance, because fear is among the recognised predictors of delay (23, 27). Messages that stress both the usefulness of prompt attendance and the fact that most lumps are not cancer are therefore preferable to messages that stress danger alone (30).

4.3 How Evaluations Are Usually Built, and Where They Fall Short

Most evaluations use a single group tested before and after the session. This design is simple but cannot separate the effect of teaching from the effect of taking the same test twice, from other sources of information, or from the tendency of unusually low scorers to improve on retesting (41, 43). Knowledge questionnaires are often written for the occasion; reliability should be reported and understood (44). Self-reported practice is flattered by the wish to give the answer the interviewer seems to expect (45). Table 3 gathers these weaknesses.

Table 3. Common weaknesses of programme evaluations and what follows from them.

Weakness	Consequence	Remedy
Single group, before and after (41)	Cannot separate teaching from other influences	Comparison group
Selection on low scores (43)	Gain partly regression to the mean	Compare like with like
Unvalidated test (44)	Unknown reliability	Report reliability
Self-reported practice (45)	Answers shaped by what is expected	Observe technique
Incomplete reporting (40, 42)	Programme cannot be repeated	Describe content and delivery
Short follow-up	Decay of knowledge unseen	Repeat at later intervals

Note: Weaknesses are drawn from the cited methodological literature and are not attributed to any single programme.

Reporting is a further problem. Without a clear account of what was taught, by whom, in what language and with what follow-up, a programme cannot be repeated or compared (40, 42). Short follow-up hides decay in knowledge, and a small sample from one village says little about another. Most evaluations do not yet reach that standard.

4.4 Design Features That Look Promising

Several features recur in the broader literature on health education and look sensible here: delivery in the local language by someone the women trust, including lay health workers (38); messages tailored to the audience (37); hands-on practice for confidence (34); follow-up contact instead of a single session (35, 36); and an honest account of what BSE can and cannot do, so that women are not told it saves lives (39). None of these has been shown, in the



studies cited here, to improve outcomes for BSE specifically.

A related question is who should deliver the teaching. Nurses and nursing tutors bring credibility and can answer questions on the spot, yet in rural areas a single visit from outside may leave no lasting trace. Community-based workers who live among the women can repeat the message and notice who has acted on it (38). Whichever model is used, the content should be simple enough to remember, delivered in a form the audience can follow whatever their schooling (28, 30), and honest about the limits of self-examination (8). These are design judgements drawn from the wider literature, not conclusions from trials of BSE teaching.

5. Discussion

5.1 Interpretation

The central point is a mismatch between what is measured and what is hoped for. Programmes are judged on knowledge, while their justification is earlier presentation and, ultimately, survival. The trial evidence does not support teaching BSE as a way of reducing deaths, and it flags harm in the form of unnecessary biopsies (9, 11). Reviews of this kind are most useful when they say plainly where the evidence stops. A programme can still be defensible if it is honest: it can teach awareness of change, explain that BSE is not proven to save lives, and connect each woman to a place where a lump will be examined (6, 7).

This is not a counsel of despair for nursing education. Teachers of nursing and community health are well placed to reach women who would not otherwise be addressed, and the same session that introduces BSE can introduce what a lump may mean, what a clinician will do and how the woman can reach one (8, 38). The

point is to be clear about what the session is for. Where it is presented as a guarantee of early detection, it promises more than the literature allows.

The same logic applies to how success is reported. A nursing programme can legitimately claim to have informed women, reached those who are usually missed and opened a channel to the health service. It should not claim to have prevented deaths. Distinguishing between these claims protects the credibility of both the programme and the profession that runs it, and it protects women from a false sense of security, which is arguably the more serious harm in a setting where a negative self-examination might be taken as a reason not to attend a clinic (9, 22). A woman who has found nothing at home may still have a problem, and the teaching should say so.

5.2 Limitations

This review shares the limitations of its form. Selection was by judgement, no systematic search was done, and relevant work, particularly from rural South Asia, will have been missed. It quotes no numerical results, because these could not be checked against the primary papers for this article. Some of the theory cited comes from other health behaviours and may transfer imperfectly. The ladder in Figure 2 is the authors' own device and has not been validated.

A further caution concerns the examples. The trials discussed come from China and Russia, and the clinical examination studies from India and the Philippines; none of them evaluated a village nursing programme as such, so every statement about rural teaching is an extrapolation. Readers should weigh it accordingly, and should be wary of any programme report that describes its results more confidently than its design permits (9, 41).



5.3 Future Work

Three needs stand out: evaluations with comparison groups, validated tests and observed technique; follow-up long enough to see whether knowledge and practice last; and outcome measures that matter, such as time from first symptom to clinic attendance (22, 42). That is slow work, but it turns a list of scores into an explanation. Readers should treat the examples here as illustrations of a pattern, not as a census.

6. Conclusion

Structured teaching programmes can raise knowledge about breast cancer and BSE among rural women, but the literature does not show that this translates into correct practice, earlier presentation or lower mortality, and the trial evidence gives no reason to promise survival benefit from BSE itself. Programmes are most defensible when they emphasise awareness, are honest about uncertainty and are linked to a service that can respond. Progress is more likely to come from careful comparison than from further reports of the same before-and-after gain.

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9. Conflict of Interest

The authors declare no conflict of interest.

10. Author Contributions

A.G. conceived the review and wrote the sections on evidence for breast self-examination. B.V. wrote the sections on community barriers and health literacy. E.F. wrote the sections on teaching theory,

programme evaluation and limitations. All authors revised the manuscript and approved the final version.

11. Ethics Statement

This is a review of published literature. No human participants, animals or field sites were involved and no ethical approval was required.

12. Data Availability

No new data were generated. All sources are cited in the reference list.

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