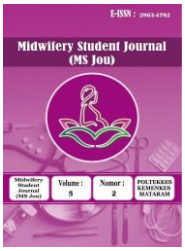
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Integration of Clinical Breast Examination Services into Family Health Posts: Changes in Knowledge and Attitudes Toward Early Breast Cancer Detection

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ABSTRACT
Background: In 2023, only 165 of 5,595 women of reproductive age in the Sedau Community Health Center area had received clinical breast examination (CBE; SADANIS). Objective: To assess changes in knowledge and attitudes after CBE services were integrated into family integrated health posts (Posyandu Keluarga). Methods: A one-group pretest–posttest study involved 70 purposively selected women aged 15–49 years. Pre- and post-intervention scores were compared using the Wilcoxon signed-rank test. Results: Mean knowledge scores increased from 23.93 to 27.67 (change: 3.74), and mean attitude scores increased from 20.89 to 26.70 (change: 5.81); both differences were statistically significant ($p < 0.001$). Two women (2.9%) had palpable breast lumps and were referred for further evaluation. Conclusion: CBE service integration was associated with improved knowledge and attitudes; causal effects cannot be established without a comparison group.
Keywords: Clinical breast examination; Family integrated health post; Early breast cancer detection; Knowledge; Attitudes.

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INTRODUCTION
Breast cancer remains a major public health challenge. In 2020, approximately 2.3 million new cases and 685,000 breast cancer deaths occurred worldwide, highlighting the importance of timely recognition and appropriate referral (Arnold et al., 2022). Improving access to information and examination services may be particularly important in communities with limited screening coverage.

Provincial health data from West Nusa Tenggara recorded 36,084 breast examinations among women of reproductive age in 2021, with substantial differences in service delivery across districts (NTB Provincial Health Office, 2021). Nevertheless, the more immediate concern for this study was limited access in the Sedau Community Health Center catchment area.

According to Sedau Community Health Center service records for 2023, only 165 of 5,595 women of reproductive age (approximately 3%) had received clinical breast examination (CBE), locally called SADANIS. The local report cited a screening target of 70%, indicating a substantial service gap. Peresak Village, one of the villages served by the center, had a large population of women of reproductive age.

CBE had mainly been offered at the primary care facility, sometimes after a woman reported a breast lump. A preliminary assessment of six family integrated health posts (Posyandu Keluarga) in Peresak Village found that none routinely provided this service (Sedau Community Health Center service data, 2023). Integrating CBE counseling, examination, and referral into

existing family health posts was therefore considered a practical way to bring services closer to the community. Previous Indonesian studies have also identified knowledge, access to information, and health-worker support as correlates of breast cancer early-detection practices (Nurfitri, 2022; Nurlita et al., 2024). Previous studies of breast self-examination (BSE), which differs from clinician-performed CBE, have reported improvements in knowledge or related outcomes after structured education (Ibitoye & Thupayegale-Tshwenegae, 2021; Sarker et al., 2022; Karimian et al., 2022).

This study aimed to assess pre–post changes in knowledge and attitudes toward early breast cancer detection among women of reproductive age following the integration of CBE services into family integrated health posts in the Sedau Community Health Center service area.

METHODS

A pre-experimental one-group pretest–posttest design was used without a comparison group. Knowledge and attitudes were measured before and after the integration of CBE services into family integrated health posts ($O_1 \rightarrow X \rightarrow O_2$). The intervention comprised health education, CBE conducted through the service, and referral when indicated.

The study population comprised 233 women of reproductive age in Tebao Hamlet, Peresak Village, in the Sedau Community Health Center service area. Seventy women attending the family integrated health post were selected by purposive sampling. Inclusion criteria were agreement to participate, age 15–49 years, nonpregnant status, and, if breastfeeding, more than six months since the start of breastfeeding. Women who declined, were outside the eligible age range, were pregnant, or were breastfeeding an infant younger than six months were excluded. Agreement to participate was therefore required; the available study record did not specify the form of consent documentation or an ethics approval/waiver identifier.

Knowledge and attitudes toward early breast cancer detection were assessed using questionnaires with numeric scores. The available study record did not specify the number of questionnaire items, the theoretical score ranges, the source of the instruments, or validation and reliability findings; these characteristics require confirmation from the investigators. Pretest questionnaires were administered two days before the family health post session. Health education and counseling were provided in two group sessions, followed by clinical examination and referral when indicated. Posttest questionnaires were collected after the integrated service; the exact interval after service delivery was not documented.

Data were analyzed using SPSS version 25. Kolmogorov–Smirnov tests were reported for pretest and posttest score distributions. Wilcoxon signed-rank tests were used to compare paired knowledge and attitude scores at a significance level of 0.05. The original analysis did not report a separate assessment of the paired-difference distributions.

RESULTS

All 70 enrolled women were included in the reported analyses. Most participants were aged 15–34 years (43/70; 61.4%); 63 (90.0%) were in the study-defined lower-risk menarche category; 38 (54.3%) had elementary or junior secondary education; 60 (85.7%) were not employed; 67 (95.7%) reported no family history of cancer; and 60 (85.7%) reported using hormonal contraception. These variables were described rather than tested as predictors of change.

Table 1. Knowledge scores before and after integration of clinical breast examination services (n = 70)

Assessment	Minimum	Maximum	Mean	SD	Mean change
Pretest	19	28	23.93	2.045	
Posttest	24	30	27.67	1.604	3.74

As presented in Table 1, mean knowledge increased from 23.93 (SD 2.045; range 19–28) to 27.67 (SD 1.604; range 24–30). The difference between the reported means was 3.74 points.

Table 2. Attitude scores before and after integration of clinical breast examination services (n = 70)

Assessment	Minimum	Maximum	Mean	SD	Mean change
Pretest	10	28	20.89	4.203	
Posttest	17	30	26.70	3.290	5.81

As shown in Table 2, the mean attitude score rose from 20.89 (SD 4.203; range 10–28) to 26.70 (SD 3.290; range 17–30), corresponding to a 5.81-point increase.

Table 3. Kolmogorov–Smirnov normality test results reported in the source manuscript

Variable	n	Mean	SD	Reported p-value
Knowledge, pretest	70	23.93	2.045	<0.001
Knowledge, posttest	70	27.67	1.604	<0.001
Attitude, pretest	70	20.89	4.203	<0.001
Attitude, posttest	70	26.70	3.290	<0.001

All four Kolmogorov–Smirnov tests yielded $p < 0.001$ (Table 3), indicating departures from normality in the observed score distributions. The original analysis reported no normality assessment of paired change scores; the Wilcoxon signed-rank tests were retained as the pre–post comparison method.

Table 4. Wilcoxon signed-rank comparisons of knowledge and attitude scores

Outcome	n	Mean rank	Sum of ranks	Z	p-value
Knowledge (pre–post)	70	35.50	2,485.00	−7.292	<0.001
Attitudes (pre–post)	70	35.50	2,485.00	−7.280	<0.001

Wilcoxon signed-rank tests showed significant pre–post differences in knowledge ($Z = −7.292$, $p < 0.001$) and attitudes ($Z = −7.280$, $p < 0.001$) (Table 4). The reported mean rank was 35.50, and the sum of ranks was 2,485.00 for each outcome. The original summary did not distinguish positive, negative, or tied ranks, so the directions of individual paired differences could not be verified from the available report; group means increased in both outcomes. During the integrated service, two of 70 participants (2.9%) were found to have palpable breast lumps and were referred for further examination; neither finding was presented as a confirmed cancer diagnosis.

DISCUSSION

The study participants represented a range of demographic and reproductive characteristics, including age, age at menarche, education, employment, family cancer history, and contraceptive use. These characteristics can be relevant when planning accessible health education. However, the present study did not analyze their associations with knowledge or attitude changes, and no conclusions about individual risk factors can be drawn from the descriptive data.

The mean knowledge score increased from 23.93 to 27.67 after the integrated CBE service. Counseling and explanation of the examination procedure may have helped participants understand the value of early assessment, including when no symptoms are present. This interpretation is consistent with a study of women of reproductive age in Indonesia reporting associations between knowledge, health literacy, and early breast cancer detection practices (Nurfitri, 2022). However, that observational study evaluated practices, whereas the present study measured pre–post knowledge scores; their findings should not be treated as equivalent evidence of effectiveness. Related BSE studies using animated videos, peer-led education, and structured teaching also reported better knowledge or skills after education (Cahyati et al., 2024; Waliyanti &

Arinandika, 2025; Uruntie et al., 2024). However, their different procedures and populations limit direct comparison with this community-based CBE service.

The integrated service also facilitated a pathway from community examination to referral. Two participants (2.9%) had palpable breast lumps and were referred for further assessment. A separate Indonesian study found that knowledge, attitudes, information exposure, family support, and health-worker support were associated with uptake of CBE services (Nurlita et al., 2024). These findings highlight the importance of access and follow-up, but the present study did not determine the final diagnoses, referral completion, or subsequent screening uptake.

Mean attitude scores increased from 20.89 to 26.70, indicating more favorable attitudes toward early detection at posttest. Access to counseling and direct interaction with health professionals may have contributed to the observed change. However, the posttest interval was not clearly documented, and attitudes were not followed over time. The findings therefore cannot demonstrate sustained behavior change or establish that service integration alone caused the improvement. Studies using smartphone applications, virtual learning, and face-to-face BSE education have similarly explored changes in beliefs, skills, and practices (Shakery et al., 2021; Kucheki et al., 2024; Cheraghalizadeh et al., 2025). Other studies highlight differences across educational approaches and the role of psychosocial factors (Ogunmodede et al., 2024; Kuru Alici et al., 2025; Dewi et al., 2022). These studies concerned BSE rather than CBE and cannot establish causality for the present service integration.

Both Wilcoxon comparisons were statistically significant ($p < 0.001$), but a one-group pretest–posttest design cannot exclude testing effects, outside information, or other changes occurring during the observation period. The questionnaire item counts, scoring rules, and psychometric properties were not available for verification, and positive/negative rank counts were absent from the source summary. Consequently, effect size and precision estimates were not recalculated. A controlled study with clearly documented instruments and longer follow-up is needed to evaluate the robustness and durability of these findings.

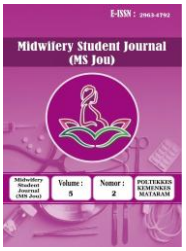
Several practical issues affected implementation. The pretest was distributed two days before the scheduled health post session because 70 women could not receive education and CBE in a single-day individual-counseling format. Health education was organized in two sessions and was mainly one-directional; some participants were distracted while caring for infants or young children. Future implementation should plan adequate midwifery staffing and examination facilities, use more interactive education, document consent and ethics review, and monitor examination uptake, referral completion, and longer-term outcomes.

CONCLUSION

Integration of clinical breast examination (SADANIS) services into family integrated health posts was associated with higher knowledge and attitude scores among 70 women of reproductive age. Mean knowledge increased by 3.74 points and mean attitude by 5.81 points (both $p < 0.001$). Because the study did not include a comparison group, these findings describe observed changes and do not establish a causal effect of service integration.

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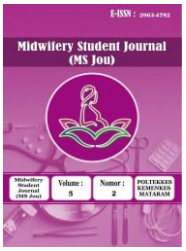
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