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Knowledge and Screening Practices for Breast Cancer among Female Teachers in Pokhara, Nepal

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ABSTRACT

Background

Breast cancer is the most common cancer among women in Nepal, and early detection is vital for reducing mortality. This study aimed to assess breast cancer knowledge and screening practices among female teachers in Pokhara, Nepal.

Methods

A cross-sectional analytical study was conducted among 198 female teachers from 13 community schools in Pokhara Metropolitan, selected via single-stage cluster sampling. Data were collected from March 12 to April 9, 2024, using a semi-structured questionnaire after obtaining ethical clearance. Data analysis was performed using SPSS version 22.

Results

Participants ages ranged from 21 to 58 years. Nearly half (44.9%) held a Master's degree in Education, and 62.1% taught at the primary level. Overall knowledge of breast cancer in three domains was present among only 2.5% of teachers, with knowledge of symptoms, risk factors, and BSE awareness/ at least monthly practice among 64.1%, 19.2%, and 16.7%, respectively. Factors significantly associated with BSE practice included a history of breast problems (p=0.016), marital status (p=<0.001), having had a clinical breast examination (p=0.003), having had a mammogram (p=0.003), higher perceived BSE self-efficacy (p=0.004), and benefit scores (p=0.011).

Conclusions

A low level of breast cancer knowledge and screening practice exists among school teachers. Targeted educational interventions focusing on risk factors, the benefits of BSE, and enhancing women's self-efficacy to perform BSE are recommended to improve breast cancer awareness and screening uptake.

Keywords: Awareness; Breast cancer; Breast self-examination; Health Belief Model.

Correspondence: Ms. Dipti Koirala, Department of Adult Nursing, College of Nursing Sciences, Gandaki Medical College, Pokhara, Nepal. Email: diptibanjara@yahoo.com, Phone: +977-9846086443 **Article received**: 2025-11-01. **Article accepted**: 2026-02-05. **Article published**: 2026-03-31.

INTRODUCTION

Breast cancer (BC) was the most common cancer in women in 157 out of 185 countries in 2022.[1] In Nepal, it is also the leading cancer among women, with 2,255 new cases reported in 2022.[2] Early diagnosis and treatment are crucial for reducing its burden.[1] Studies across various female populations in Nepal indicate limited awareness and poor screening practices among Nepali women.[3-9] Female teachers who are aware of BC and screening methods can play a pivotal role in reaching women in the community and educating students in the long term.[10] Furthermore, the Health Belief Model (HBM) has been shown to predict such screening behaviours among women in low- and middle-income countries.[11,12] Therefore, this study aimed to investigate BC knowledge and screening practices among female teachers in Pokhara and to examine the role of HBM constructs in predicting breast self-examination (BSE) practice.

METHODS

A cross-sectional study was conducted among female teachers teaching at primary to secondary levels within secondary-level community schools in Pokhara Metropolitan, Kaski district, Nepal. The metropolitan has 33 wards and 207 community schools, 75 of which are at the secondary level. Secondary-level schools were purposively selected to include teachers from all grades (primary to secondary), and Pokhara Metropolitan was chosen as the researcher had access to the teacher registry for this area during the study period. According to the Education Division, Pokhara, there were 654 female teachers in these 75 schools as of December 23 2025. The sample size was calculated using the formula for a single population proportion: $n = Z^2pq/d^2$, with a finite population correction and an added 10% non-response rate. Using Z=1.96 (5% significance), p=0.192 (proportion of women performing monthly BSE in Nepal[8]), and d=0.05, the minimum required sample size was 194.

A single-stage cluster sampling technique was employed, with each school considered a cluster. Schools were randomly selected using a lottery method from the list of 75 schools. All female teachers present in the selected schools who provided consent were included until the sample size was met. Data were collected from 198 teachers across 13 schools. Data were collected using a structured questionnaire in four parts. Part I and II covered socio-demographic and health-related information. Part III assessed BC knowledge (warning signs: 11 items, risk factors: 10 items) and practices of BSE, CBE, and mammography (yes/no). Teacher was considered to be knowledgeable/aware of BC if she identified ≥5 non-lump symptoms from a list of eleven; identified ≥5 out of ten risk factors, including age-related risk; and also reported checking her breasts at least once a week or month.[11,13] Part IV consisted of 37 items on a 5-point Likert scale (1=completely disagree, 5=completely agree) measuring six HBM constructs: perceived susceptibility (3 items), perceived seriousness (7 items), perceived benefits (6 items), perceived barriers (6 items), health motivation (7 items), and self-efficacy/confidence (8 items), adapted from Champion's Health Belief Model Scale (CHBMS). Higher scores indicated greater levels of each construct.[14]

The questionnaire's validity was ensured through an extensive literature review, consultation with research experts and an oncologist, and adaptation of validated and reliable tools (Breast-CAM and CHBMS).[11,13–23] Pre-testing was conducted among 20 female teachers from two schools of Pokhara.

Ethical clearance was obtained from the Institutional Review Committee of Gandaki Medical College (Ref No. 15/080/081). Permission was also secured from the Pokhara Education Division and respective school headteachers. Data were collected by the researcher via a school-to-school survey from March 12 to April 9, 2024. In each school, teachers gathered in a designated room (library, meeting hall) and completed the questionnaire via self-administration (taking 20-30 minutes). Informed consent was obtained from all participants. Immediately after data collection at each school, a health education session

on BC and BSE was conducted using a multimedia projector and demonstration. Participants with breast concerns were referred to a gynaecologist.

Data were analysed using IBM SPSS Statistics version 22. Descriptive Statistics summarized demographic data, knowledge, HBM variables, and screening practices. Inferential statistics included independent samples t-tests to examine differences in continuous variables (knowledge scores, HBM scores) and chi-square tests to measure associations between categorical variables and BSE practice. The level of significance was set at $p < 0.05$.

RESULTS

This study was conducted among 198 female teachers at secondary-level community schools in Pokhara. Their average age was 40.99 years (SD 8.10 years), with a range of 21 to 58 years. Nearly half (51.5%) were between 20 and 40 years, and the rest were between 41 and 60 years. By ethnicity, 80.3% were Brahmin/Chhetri, and the rest were Janajatis and Dalit.

Almost all (94.4%) were Hindus, and the rest were Buddhist and Bon by religion. Regarding marital status, 94.4% were married, and the remaining were unmarried/widow. Nearly half (44.9%) had a master's degree or higher, 33.3% had a bachelor's degree, and 21.7% had an undergraduate level of education. More than half (57.1%) were permanent in their job, and they were teaching at primary (62.1%), lower secondary (20.2%) and secondary (17.7%) level.

Their average work duration was 11.26 years (SD 8.76 years), ranging from 1 to 37 years. Few respondents had a history of breast problems (12.1%) and a family history of BC (6.6%). Around one-fifth of them (24.3%) had a social history of BC, i.e., they had friends or neighbours with BC. Nearly one third (30.8%) had not enrolled in national health insurance, whereas 55.1% had and 14.1% had in the past but not renewed status. Knowledge of BC symptoms and risk factors was found among 64.1% and 19.2% of the teachers, respectively, i.e., they could identify five or more non-lump symptoms out of 11 and five risk factors out of 10 risk factors of BC. Less than one-fifth (16.7%) reported checking their breast at least weekly or monthly which meant being aware of BSE in this study. Thus, data revealed that only five teachers (2.5%) had overall knowledge of BC in three domains. The five most known symptoms were a lump or thickening in the breast (85.9%), discharge or bleeding from the nipple (71.7%), a lump under the armpit (63.6%), nipple rash (59.6%) and pain in one of breast or armpits (56.6%). The five most commonly known risk factors were having a close relative with BC (58.6%), having a history of BC (49.5%), drinking alcohol every day (42.4%), doing less than 30 minutes of moderate physical activity 5 times a week (36.9%) and using hormone replacement therapy (25.3%).

This study also measured differences in knowledge score of BC according to socio-demographic and health-related variables using independent samples T test and found that job duration (p=0.040) and having a social history of BC (p=0.026) had statistically significant differences. Based on the mean score, the knowledge score was significantly higher among those women who had a work duration of 10 years or more and had a social history of BC. However, no significant difference in the score was depicted in relation to age, education level, job type, teaching level, having health insurance, having breast problems in the past, having a family member with BC, or marital status. Likewise, there was no significant difference in knowledge score according to BC screening practices: BSE, CBE, and mammography.

Table 1 shows the BC screening practices of the teachers. BSE was ever performed by 76.3% of the respondents. However, examination according to the guideline, i.e., at least monthly, was practiced by 16.7% of the respondents. Few respondents (13.6%) reported that they had been to see a doctor for a change noticed in one of their breasts. One-third (27.8%) had clinical breast examination (CBE), and 15.7% had done mammography in the past.

Bivariate analysis of BC screening (BSE practice)

Table 1. BC Screening practices among the teachers (n=198).	
Items	**n (%)**
Ever done a BSE	
Yes	15 (76.3)
No	47 (23.7)
Frequency of practice of BSE	
Never/Rarely/Sometime/once a year/ twice a year/Don't know	165 (83.3)
At least once a month/week	33 (16.7)
Ever visited a doctor for a change you have noticed in one of your breasts	
Yes	27 (13.6)
No	124 (62.6)
Never noticed a change in my breasts	38 (19.2)
Don't know	9 (4.5)
Ever had a clinical breast examination	
Yes	55 (27.8)
No	143 (72.2)
Ever done mammography	
Yes	31 (15.7)
No	167 (84.3)

and socio-demographic and health-related variables was performed. Result found a significant association of practice of BSE with variables like having a history of breast problems (p=0.016), marital status (p=0.006), having CBE (p=0.003), and having done mammography (p=0.003). Those who had past breast problem, were married, had ever had CBE, and had done mammography tend to perform BSE in comparison to their counterparts Table 2. However, there was no statistically significant association of BSE practice with age, education level, current job type, duration of work, current level of teaching, having health insurance, having family member with BC and having friend/neighbour with BC.

We also assessed the difference in HBM constructs score according to socio-demographic and health-related variables of respondents. There is statistically significant difference among the groups in perceived susceptibility score according to variable like having breast problem in past only (p= 0.03). The mean of perceived susceptibility is greater among those

Table 2. Association of BSE practice with socio-demographic and health-related variables (n=198).

Characteristics	Ever done BSE		χ^2	p Value	COR (95% CI)
	No (%)	No (%)			
Education level					
Bachelor and below	82 (75.2)	27 (24.8)	0.143	0.705	
Master and above	69 (77.5)	20 (22.5)			
Duration of current work					
≤ 10 years	81 (71.7)	32 (28.3)	3.052	0.081	
> 10 years	70 (82.4)	15 (17.6)			
Current level of teaching					
Primary	97 (78.9)	26 (21.1)	1.212	0.271	
Lower secondary & secondary	54 (72.0)	21 (28.0)			
Had breast problem in past					
Yes	23 (95.8)	1 (4.2)	5.778	0.016	8.266 (1.085-62.952)
No	128 (73.6)	46 (26.4)			
Marital status					
Ever married	148 (78.3)	41 (21.7)		0.006[f]	0.139 (0.033-0.578)
Never married	3 (33.3)	6 (66.7)			
Ever done CBE					
Yes	50 (90.9)	5 (9.1)	9.024	0.003	0.24 (0.09-0.6645)
No	101 (70.6)	42 (29.4)			
Ever done Mammography					
Yes	30 (96.8)	1 (3.2)	8.542	0.003	-0.088 (0.012-0.662)
No	121 (72.5)	46 (27.5)			

p value significant (<.05) [f] Fisher's Exact Value

Table 3. Descriptive statistics of CHBM subscale variables (n=198).			
CHBM Subscales	**Possible score range**	**Obtained minimum, maximum score**	**Overall mean score**
Perceived susceptibility (Items 3)	3-15	3, 14	7.06 ± 2.15
Perceived severity (Items 7)	7-35	7, 34	20.52 ±5.05
Self-efficacy (Items 8)	8-40	8, 39	24.85 ±5.52
Perceived benefits (Items 6)	6-30	6, 30	22.21 ±4.25
Perceived barrier (Items 6)	6-30	6, 30	13.35 ±4.04
General health motivation (Items 7)	7-35	7, 35	27.47 ±4.20

HBM score ranged from 1-5 scale

having past breast problem in comparison to their counterparts. There is no statistically significant difference in perceived severity, self-efficacy, perceived benefit and barrier score with variables like age, marital status, education level, having breast problem in past, having family member with BC, and having social history of BC. There is statistically significant difference in the general health motivation score according to marital status only (p= 0.027). We examined the mean difference in the HBM scale score (perceived susceptibility, severity, benefits, barriers, health motivation, and confidence) among BSE performers and non-performers. We found that the perceived benefits of BSE and BSE self-efficacy scores were significantly higher among BSE performers than among women who never performed BSE (t <- 2.558, p <0.011). The groups did not differ concerning perceived susceptibility, perceived severity, perceived barriers, and general health motivation (Table 4).

Table 4. Comparison of CHBM Factors among BSE Performers and Non-performers.					
Variables	**Performing BSE**		**t**	**df**	**P value**
	Yes	**No**			
	Mean (SD)	**Mean (SD)**			
Susceptibility	7.18 (2.11)	6.68 (2.26)	-1.404	196	0.162
Severity	20.45 (5.36)	20.74 (3.98)	0.396	102.551#	0.693
Self-efficacy	25.47 (5.18)	22.87 (6.14)	-2.876	196	0.004*
Benefits	22.64 (4.09)	20.85 (4.49)	-2.558	196	0.011*
Barriers	13.13 (4.12)	14.06 (3.73)	1.372	196	0.172
General health motivation	27.22 (4.42)	28.29 (3.33)	1.532	196	0.127

#Levene's test indicated unequal variances (F's 5.618, p's 0.019, so degrees of freedom were adjusted

DISCUSSION

This study found that around two-thirds (64.1%) of the teachers knew BC symptoms. This proportion is similar to that of Vietnamese women (61%).[11] The five most known symptoms are similar to the findings done among Vietnamese women and among school teachers of the Gokarneswor municipality of Kathmandu.[9,11] BC risk factors were known to only 19.2% of the teachers. This proportion of knowing is low in our study in comparison to a study that reported 40% of respondents knew BC risk factors.[11] Less than one-fifth (16.7%) reported examining their breast at least monthly or more frequently, which meant being aware of BC screening in our study. Overall, very few (2.5%) knew BC in all three domains (symptoms, risk factors, and BSE), which is lower in comparison to Vietnamese women (18%).[11] However, this finding is supported by various studies conducted in Nepal among women showing poor/inadequate knowledge reflecting the need of BC education.[3,9,24]

Duration of teaching (p=0.040) and having a social history of BC (p=0.026) tend to influence BC knowledge score in this study. Those who had work experience of less than 10 years or had friends or neighbours with BC had higher BC knowledge compared to their counterparts. However, age,

education level, job type, teaching level, having health insurance, having breast problems in the past, having a family member with BC and marital status showed no statistically significant difference in BC knowledge score. In line with the current study findings, a study among schoolteachers in Saudi Arabia also revealed that educational level, family history, and personal breast problems had no association with knowledge. However, marital status and age were associated in that study.[25] In contrast to our findings, *Pokharel et al.* revealed that education status had a significant association with awareness level.[9] Neighbours or friends can be the major source of BC knowledge which can be used while planning and providing BC education programs

This study revealed that BSE was ever done by 76.3% of the teachers. However, only 16.7% reported examining their breasts at least monthly or more often. Few respondents (13.6%) had ever been to see a doctor about a change they had noticed in their breasts. One-third of the respondents (27.8%) had ever done CBE, and 15.7% had done mammography. This proportion is lower than in the study conducted among female academicians in Turkey, which showed 41.5% performed BSE regularly, 48.5% had at least one CBE, and 33.5% had at least one mammography.[26] In line with present study findings, a study conducted among women residing in Kathmandu found that 3.4% had undergone MMG biennially, 7.2% CBE annually, and 14.4% BSE monthly.[4] Poudel and Dhakal (2021) also showed low prevalence of screening behaviour among women of Pokhara: BSE (15.2%), CBE (54.5%), Mammography (27.3%), and breast ultrasound (3.0%).[6] The proportion of doing BSE is similar to the finding of *Mulmi et al*. done among first-degree female relatives of BC patients at BPKMCH, whereas it is greater in comparison to women of Butwal sub-metropolitan city (19.2%).[5, 4] The greater proportion of women practicing BSE in this study in comparison to women of Butwal may be because this study's population group was academic women, which would have increased awareness in comparison to the general women. However, monthly performance was among only 16.7%, which is similar to other women in Nepal. This finding reflects the need to reinforce the female teachers to be aware of their breasts.

This study found no significant difference in BC knowledge score according to BC screening practices: BSE, CBE and mammography. Having knowledge of BC does not tend to influence the practice. This finding is in contrast to the finding of *Mousavi et al.* which showed the score of BCKT had a significant difference between BSE performers and non-performers ($p = 0.001$).[27] However, in line with this study's finding, *Taneepanichskul et al.* also found that high awareness of BC was not associated with practicing of BSE. Only high knowledge of BSE was associated with absolute confidence in BSE ($p<0.05$).[28] Thus, it can be inferred that having knowledge of BC does not influence BSE practice.

While measuring the association between BSE practice and selected variables, this study found no association of age, education level, job type, job duration, teaching level, having health insurance, having family member and friends/neighbour with BC with BSE practice. However, the practice of BSE had a statistically significant association with variables like having a past history of breast problems ($p=<0.016$), marital status ($p=<0.001$), having CBE ($p=0.003$), and having done mammography ($p=0.003$) in this sample.

Women having past breast problem, married, ever had CBE and undergone mammography tend to perform BSE. Contrary to this study's finding, a study showed age had a significant association ($p=<0.001$) with BSE practice.[26] Likewise, *Dewi et al.* also showed that older age, higher education, and having a history of a family member with cancer were all positively correlated with performing BSE.[19] In line with present study findings, a study also revealed that having a history of BC in the family had no association with BSE practice.[26] Banstola and Koirala also showed no association between sociodemographic variables and knowledge level of the female adolescents of Kaski.[24] Factors like educational status, having heard about BC,

and having breast problems were associated with screening behaviours in a study.[6] Supporting our study findings, Pirzadeh also found that marital status (p = 0.002) was associated with the practice of BSE.[29]

This study also assessed health beliefs related to BC and BSE using the CHBM scale. The mean scores of the HBM constructs in the present study are: perceived susceptibility (7.07 ± 2.15), perceived severity (20.52 ± 5.05), self-efficacy (24.85 ± 5.52), perceived benefits (22.21 ± 4.25), perceived barriers (13.35 ± 4.04) and general health motivation (27.47 ± 4.20). The mean scores of the HBM constructs in a study done by Pirzadh were: perceived susceptibility (8.77 ± 4.16), perceived severity (24.63 ± 5.80), perceived benefits (22.96± 12.86), and perceived barriers (27.21 ±17.18) among Iranian female university students.[29]

In the present study, the mean score of perceived susceptibility was 7.07 ± 2.15, which does not seem to be high and could be due to the low level of awareness about age-related and other risks of BC. They might believe that they are not at risk of developing BC, as in a study.[30] They might have a false perception that they are generally healthy and do not need to perform BSE, as in a study done on female students in Malaysia.[31]

The researcher examined the mean difference in the HBM scale score among BSE performers and non-performers. It is found that the perceived benefits of BSE and BSE self-efficacy score are significantly higher among BSE performers than among women who never performed BSE (t's<-2.558, p's<0.011), which is in line with the HBM.[15] However, the groups did not differ for other HBM variables (perceived susceptibility, perceived severity, perceived barriers, and general health motivation), which contrasts with the expectation. In a study conducted among female academicians, sensitivity, benefits, self-efficacy, health motivation, and barriers were found to be related to performing BSE.[26] This result might be due to women having inadequate knowledge about vulnerability to BC and the severity of the disease. It might also be due to the presence of some women in the study who may have had unrealistically optimistic perceptions of their health and thus felt less urgency about performing BSE.[19] The contradiction in our findings as compared to other studies and HBM concepts calls for speculation of other possible underlying factors, unique to Nepalese women.

CONCLUSIONS

Based on the findings of the study, it can be concluded that a low degree of BC knowledge and regular screening practices prevail among the female teachers in Pokhara. Having past breast problems, marital status, ever done CBE, mammography, perceived benefits, and self-efficacy tend to have an effect on BSE practice. Therefore, targeted educational interventions focusing on risk factors, and the benefits of BSE, and enhancing self-confidence in performing BSE are recommended for increasing BC knowledge and promoting regular BSE among the teachers.

Limitations

Our study has several limitations. First, since this study was cross-sectional, we cannot make causal claims regarding the relationships of BC knowledge and BSE practice with socio-demographic and HBM correlates.

Second, the data were collected by using a self-reporting questionnaire, and women were asked to report only whether they had ever performed BSE, not whether they were aware of the BSE guidelines. The difference between women's self-reported knowledge and their actual knowledge could be explored further in future studies.

Third, BC knowledge meant the respondents' ability to correctly identify BC symptoms, and risk factors and also reported checking their breasts at least once a week or once a month. Researcher has not measured the teacher's present degree of knowledge on BSE in general. Their practice and perceived efficacy, benefit, and barriers to BSE was assessed under CHBM scale. Their actual knowledge on BSE could be explored further in future studies.

The unexpected finding that the non-significant relationship between BSE practice and perceived susceptibility, severity, barrier and general health motivation suggests that some of the women in this study may have had unrealistically optimistic perceptions of their own health and so felt less urgency about performing BSE. Therefore, future studies should investigate the impact of optimistic bias on perceptions of BC susceptibility and the need to engage in screening behaviors.[19]

Study samples were taken from the community schools of only one metropolitan of Kaski, providing limited power to be generalized to reflect the entire knowledge and practice of all teachers of the Kaski district.

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Availability of data and materials

All data analysed during this study will be made available upon reasonable request from the corresponding author.

Authors contribution

Conceptualization: Dipti Koirala,Chitra Bahadur Budhathoki.

Data curation: Dipti Koirala, Chitra Bahadur Budhathoki.

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