

Knowledge, Attitude and Practice (KAP) on Breast Self-Examination (BSE) amongst Young Female Students and Adult Females in Pune, Maharashtra - A Comparative Study

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Abstract: Introduction: Breast cancer is the commonest cancer in Indian females, and its mortality rate is relatively high. Early detection is crucial for better prognosis, and breast self-examination (BSE) is a simple tool that can aid in early detection of any abnormality. Although there has been an increasing trend in its incidence, awareness and practice of BSE are still lacking in various age groups.

Methods: This analysis-based cross-sectional study shall be carried out among 200 subjects, comprising 100 young female students between 17 and 23 years old from Dr. D. Y. Patil University, Pimpri, Pune and 100 adult women between 24 and 60 years old from local neighborhoods. Participants will be recruited through convenient sampling. KAP information for BSE will be obtained using a pretested and semi-structured questionnaire. The gathered data will be analyzed descriptively and inferentially, employing the use of the Chi-square test, independent t-test, and logistic regression techniques.

Results: It is anticipated that there will be significant differences between the two groups in terms of KAP. Young female students will exhibit superior knowledge, yet poor practice of BSE, whereas adult women will display an optimistic attitude toward the practice, with different degrees of practice. The socio-demographic characteristics of the respondents will significantly influence KAP.

Conclusion: The results of this study will be useful in highlighting significant gaps in knowledge and practices regarding BSE among various socio-demographic groups. The results will be helpful in designing effective interventions that may assist in early detection of breast cancer cases.

Keywords: Words: Breast Self Examination; Breast Cancer; KAP; Women; Socio-Demographic Factors; India

1. Introduction

Breast cancer is the commonest cancer among women in India.¹ It is also the second largest contributor to cancer-related morbidity and mortality.² Early detection of breast cancer is crucial in enhancing the survival chances of women diagnosed with the disease. Breast self-examination (BSE) is a simple, cost-effective technique that women can utilize to detect any early changes in the breast.³⁻⁴

However, despite its benefits, the practice of BSE is poor in several regions in India. In a national KAP survey of BSE among women aged 30 years and above, it was revealed that while majority of the respondents had some knowledge regarding BSE, their attitude and practices were poor, as only a small percentage engaged in BSE, despite having knowledge of its steps.⁶ Several studies conducted in Indian cities and semi-cities reveal that there is a clear disparity between knowledge and practice, and sociodemographic determinants like age, marital status, education level, and socioeconomic status play a crucial role in adopting BSE behavior.⁷⁻⁹ From the available data, it is also evident that women below the age of 45 years are less likely to practice BSE than women above the age of 45 years, probably owing to their perceived perception of being too young for breast cancer.⁷

Pune, Maharashtra is an expanding city that consists of educated youngsters along with socio-economic adults. Breast cancer cases are increasing in Pune, Maharashtra, and most of the patients are detected at a later stage.¹⁰

According to local oncology and breast health studies conducted by hospitals and cancer care facilities in Pune, early detection is essential, as early diagnosis increases chances of life beyond 90%, while for advanced stages, the chances are much lesser.^{10–12} There is no published study available on the comparison between female young college/university students and adult females regarding breast self-examination.

The socio-demographic factors that have been chosen, including age, marital status, educational level, and socio-economic status (SES), seem to play a critical role in determining breast self-examination (BSE) behavior. Research from India reveals that education and SES are directly correlated to an increased understanding and frequency of BSE. On the other hand, less educated, low-income, and rural or semi-urban women refrain from or neglect BSE.⁷⁹ Other research has also revealed that married women practice BSE more frequently than unmarried women. This is because married women tend to be more involved in conversations about health within their families and have access to information related to reproductive health.⁷⁹ The differences in the KAP of BSE may vary widely between young, unmarried, college-going women and older, married, working or homemaker women. However, there are limited studies comparing these groups in urban Indian cities like Pune.⁷⁹

The national cancer control programs in India, such as NPCDCS, support population-based screening of common cancers, including breast cancer, using primary health care services.¹³ The NPCDCS program supports early cancer detection through clinical breast examination and public health education on breast health practices, including BSE practice among women older than 30 years.^{11–13} But, the implementation of the programs lacks widespread coverage, and there is poor community involvement, especially among younger women and low socio-economic status populations.^{11–13}

With respect to this backdrop, a comparative study of knowledge, attitudes, and practices related to the topic of “Breast Self-Examination for Early Detection of Breast Cancer” amongst young women students and mature females in Pune, Maharashtra becomes very much important. The reasons include that by comparing differences between the KAP of the two groups along with the association between various socio-demographic factors such as age, marital status, level of education, and SES, we could help:

- Ideally understand the gap in knowledge and attitude amongst the two groups
- Identify which socio-demographic strata needs education about BSE the most, and
- Gain information to plan for designing health-education modules for schools and colleges, as well as community-level awareness activities for adult females.

This would be of immense value in devising a plan for early detection of breast cancer amongst females in Pune and can prove as an example for other urban areas in the country, where there exists a rising burden of breast cancer alongside unequal levels of health literacy amongst young and old females.

2. Materials and Methods

Design and Setting

A cross-sectional analytical study comparing KAP related to BSE was conducted between young female students and adult females. Collection of data was done amongst female undergraduate and postgraduate students (excluding health care students) at Dr. D. Y. Patil University, Pimpri, Pune, as well as adult females from nearby communities (urban/urban slum).

Participants

The young female students were females aged 17–23 years, attending college on regular basis (non-medical colleges) at Dr. D. Y. Patil University. The adult females were aged 24–60 years, living in nearby Pune communities, and not undergoing any educational courses.

Inclusion Criteria: Age group 17-23 years (students) or age group 24-60 years (adults); capable of understanding/questionnaire completion; providing consent for participation.

Exclusion Criteria: Previous history of breast cancer or malignancies, mastectomy/breast surgeries; severe deafness/loss of vision or intelligence; pregnant women; non-consenting participants.

Sample Size

The sample size was estimated through WinPEPI version 11.65 (Abramson, 2021) for two groups where 45% would have good BSE knowledge among students compared to only 25% among adults (India-wide KAP data). The calculation assumed $\alpha=0.05$ (two-tailed), power=75%, and precision=7.5%, resulting in 83 subjects per group, but with 2

Sampling and Ethical Considerations

Ethical clearance will be sought from the Institutional Sub-Ethics Committee, Dr. D. Y. Patil University, Pimpri, Pune, before collecting the data. Convenience sampling will be done depending on the availability of participants and their willingness to participate. All the participants will be required to sign an informed consent form after being briefed about the aims of the study and the voluntary nature of their participation, with the option to drop out at any stage without any consequences.

3. Data Collection Tool

A semi-structured closed-ended KAP questionnaire adopted from the validated tool developed by Sachdeva et al. (2021) ["Knowledge, Attitude and Practices of Breast Self-Examination Amongst Indian Women: A Pan-India Study" (Asian Pac J Cancer Care 2021;2(2):103–110)] was used. The questionnaire was evaluated for content validity by three subject matter experts (Pharmacologist / Research Expert) and pre-tested among ten individuals (five students and five adults) to ensure clarity of language; no changes were done in the content.

The KAP questionnaire was categorized into three categories based on factor analysis. Questions from 1 to 15 were related to the knowledge category that covered various methods of doing BSE. Questions from 16 to 28 belonged to the attitude category that covered attitude towards breast self-examination. Finally, questions from 29 to 35 were concerned with practice that covered various practices of BSE. The knowledge category was assessed using the True, False, or "I don't know" option while the attitude and practice categories were measured using a 5-point Likert scale.

For positive knowledge questions, the scores were 2 for a correct answer, 1 for "I do not know," and 0 for an incorrect response. For negative knowledge questions, the scores were vice versa. In positive attitude questions, scores of 4 for "strongly agree," 3 for "agree," 2 for "neutral," 1 for "disagree," and 0 for "strongly disagree" were assigned, and for negative attitude questions, the scores were vice versa. For positive practice questions, scores of 0 for "never," 1 for "seldom," 2 for "neutral," 3 for "frequently," and 4 for "always" were assigned, and for negative practice questions, the scores were vice versa. Respondents who scored more than 70 percent for each domain had good knowledge, attitude, and practice, and those who scored less than 70 percent had poor knowledge, attitude, and practice.

Age, highest level of education, occupation, place of residence now, place of origin, marital status, number of children, family history of breast cancer, pregnant, and currently breastfeeding were some demographic characteristics.

4. Statistical Analysis

The data will be collected in a structured manner via Microsoft Excel software and analysed via IBM SPSS Statistics software (version 22.0 or above). Prior to analysing the data, it will first be cleansed for any gaps or inconsistencies in the data; proper codes will be created for both socio-demographic indicators and KAP components (knowledge, attitudes, practices).

Initially, some descriptive statistics will be performed as follows:

- Calculation of frequencies and percentages for all categorical data (e.g., levels of knowledge, attitudes, practices, marital status, and educational attainment).
- Calculation of means and standard deviations for all continuous data (e.g., age and years of schooling).

Secondly, the construction of the KAP Scores shall involve the following steps:

- The knowledge score is calculated by giving 1 mark for each correct answer and zero for wrong answers or those who do not know. The total marks earned in this category are then scored either as adequate or inadequate according to median marks or predefined cut-off point ($\geq 75\%$ of questions answered correctly = adequate knowledge).
- The attitude score is determined from a Likert type of scale that rates responses from strongly agree to strongly disagree. Again, the total attitude score is scored positive or negative according to median.
- The practice score for BSE depends on frequency and method of doing BSE (i.e. whether it is regular practice or irregular/non-practice).

The next step is to compare young female students with adult women on the basis of:

- Chi-square test for categorical data (such as proportion with adequate knowledge, positive attitude, or practice).
- Mann–Whitney U test was applied for comparing knowledge, attitude, and practice (KAP) scores of both groups.
- Kruskal-Wallis test followed by Dunn’s multiple comparison was applied for comparing multi-groups.

For finding the association of knowledge, attitude, and practice (KAP) with selected socio-demographic variables, the following tests will be utilized:

- Chi-square test (both uni and multivariate) will be applied for testing association of adequate knowledge, positive attitude, and practice of BSE with variables such as age, marital status, educational status, and socioeconomic status.
- P-value less than 0.25 in univariate analysis would be included in multivariate analysis and statistical significance would be set at $P < 0.05$ with CI of 95%.

In addition to group stratification, analysis will also be stratified into subgroups based on age, marital status, and education among both groups.

5. Result

Table 1: Mean KAP Scores of Knowledge, Attitude, and Practice Domains among Participants’ Groups

Domain	Group	n	Mean	SD	% of Max
Knowledge (max=30)	Young (17–23)	104	24.82	3.31	82.7%
Knowledge (max=30)	Adult (24–60)	115	21.81	8.39	72.7%
Attitude (max=52)	Young (17–23)	104	34.66	6.68	66.7%
Attitude (max=52)	Adult (24–60)	115	35.06	6.29	67.4%
Practice (max=28)	Young (17–23)	104	15.23	5.57	54.4%
Practice (max=28)	Adult (24–60)	115	16.39	4.88	58.5%
Total KAP (max=110)	Young (17–23)	104	74.71	10.99	67.9%
Total KAP (max=110)	Adult (24–60)	115	73.26	14.93	66.6%

Note: Practice scores are relatively low in both categories (54%-59%) compared to Knowledge (73%-83%), which is consistent with the Knowledge-Practice gap seen in many health behaviours studies.

Table 2: Good/Poor KAP Classification (>70% threshold)

Domain	Young Good %	Young Poor %	Adult Good %	Adult Poor %
Knowledge	86.5%	13.5%	74.8%	25.2%
Attitude	43.3%	56.7%	40.9%	59.1%
Practice	23.1%	76.9%	27.0%	73.0%

Both categories have satisfactory Knowledge scores, but the Practice scores are poor. Only 23%-27% of respondents have Good Practice, indicating that knowledge does not necessarily influence behavior change.

6. Inferential Analysis — Between-Group Comparisons

Table 3: Mann-Whitney U Test (Young vs Adult)

Domain	U statistic	p-value	Sig.	Effect r	Interpretation
Knowledge	6944	0.0382	*	0.140	Small; Young > Adult
Attitude	5858	0.7942	ns	0.018	No difference
Practice	5103	0.0605	ns	0.127	Marginal (ns)
Total KAP	5792	0.6887	ns	0.027	No difference

* $p < 0.05$ ** $p < 0.01$ ns = not significant | Effect size r: small=0.1, medium=0.3, large=0.5

Key finding: Young women demonstrate considerably higher scores in Knowledge compared to Adult women ($p=0.038$). There is no statistical difference in Attitude and Practice scores.

Table 4: Chi-Square Test — KAP Category (Good/Poor) vs Group

Domain	Chi-square	df	p-value	Significance
Knowledge (Good/Poor)	4.067	1	0.0437	*
Attitude (Good/Poor)	0.049	1	0.8242	ns
Practice (Good/Poor)	0.255	1	0.6135	ns

A larger proportion of Young women possess Good Knowledge (86.5%) in comparison to Adult women (74.8%; $p=0.044$). No statistically significant differences in Attitude and Practice groups.

Socio-Demographic Associations

Table 5: Kruskal-Wallis Test — KAP by Education Level

Domain	KW H	p-value	Graduate	HSC/Diploma	Postgraduate	Other
Knowledge	5.130	0.163 ns	25.04	24.22	24.33	20.52
Attitude	9.873	0.020 *	36.25	33.47	36.22	33.53
Practice	2.005	0.571 ns	15.96	15.66	17.39	15.40

There were significant attitude scores according to education level ($H=9.87$, $p=0.020$). Respondents in Graduate/Postgraduate category have higher attitudes than HSC/Diploma respondents (~36 vs. 33.5). There was no significant effect of education level on Knowledge and Practice domains.

Table 6: Kruskal-Wallis Test — KAP by Marital Status

Domain	KW H	p-value	Single	Married	Widowed
Knowledge	7.507	0.023 *	24.77	24.21	27.00
Attitude	11.802	0.003 **	35.69	35.25	28.00
Practice	2.667	0.264 ns	15.33	16.87	17.00

There were significant differences between Knowledge ($p=0.023$) and Attitude ($p=0.003$) according to marital status. The widowed participants ($n=1$) had the highest score for Knowledge. Within major categories, single females have marginally higher Attitude than married females. There were no significant differences according to marital status regarding Practice.

Spearman Correlation: Age vs KAP Scores (Full Sample)

Domain	rs	p-value	Sig.
Knowledge	-0.097	0.172	ns
Attitude	0.061	0.388	ns
Practice	0.118	0.094	ns
Total KAP	0.094	0.183	ns

The age variable as a continuous variable showed no significant linear relationship with any KAP domain, which suggests that the Knowledge category difference is indeed categorical.

However, the null hypothesis could not be fully accepted since there were significant differences noted in knowledge amongst groups and demographic factors whereas attitude and practice showed similar statistics amongst different groups.

7. Discussion

In this study, it is noted that the strongest element amongst the three components in the KAP was knowledge. The results revealed that knowledge scored above 70% amongst the two categories of women. From the graph shown below, it can be seen that young women exhibited significant levels of knowledge as compared to adult women ($p=0.038$). It should also be noted that young women had more consistency when it came to score levels.

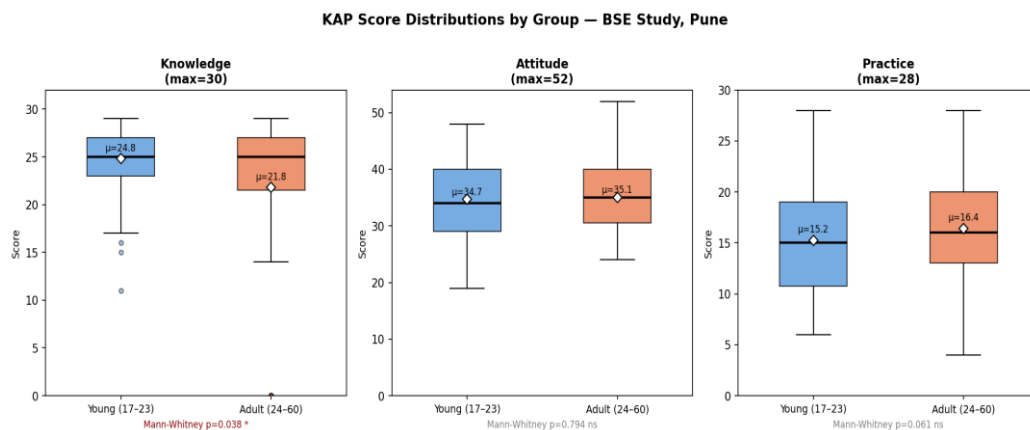


Figure 1: KAP Score Distributions by Group (Box Plots)

Figure 1: Box plots showing median, IQR, and spread of Knowledge, Attitude, and Practice scores. Diamond markers indicate group means. Young women show notably tighter distribution in Knowledge.

On the other hand, attitudes about breast self-examinations (BSE) were observed to be moderate for both the categories, with a score level of 67% of the total score with no significant difference between the two categories. In addition, Figure 2 indicates that the level of education is one important variable that influences attitude because the mean attitude scores were higher for graduates and postgraduates compared to their counterparts ($p = 0.020$).

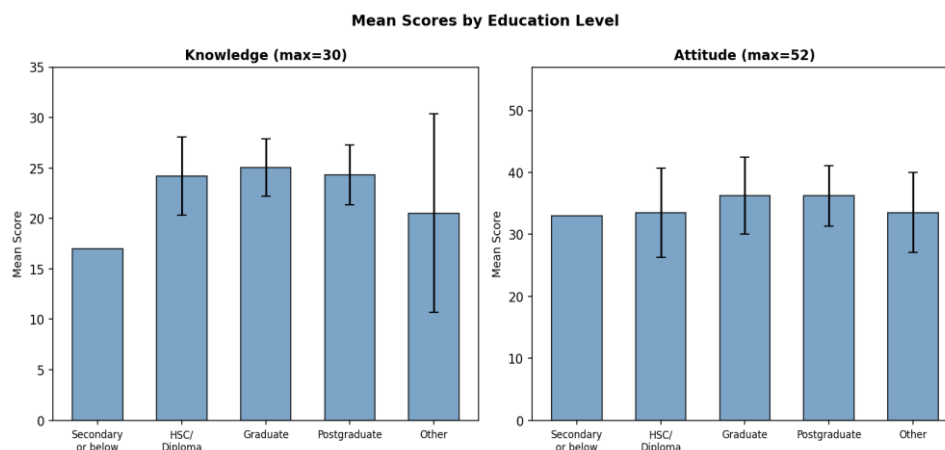


Figure 2: KAP Scores by Education Level

Figure 2: Mean Knowledge and Attitude scores ($\pm$ SD) by education category. Graduate and Postgraduate respondents show higher Attitude scores than lower-education groups.

Yet, the performance of all participants was quite poor, scoring less than 60% of the best possible score. As seen in Figure 3, only between 23 and 27% of all participants reached the standard of good practice (scoring >70%),

which means that their practice was much lower than needed for either group. This demonstrates a considerable gap between knowledge and practice.

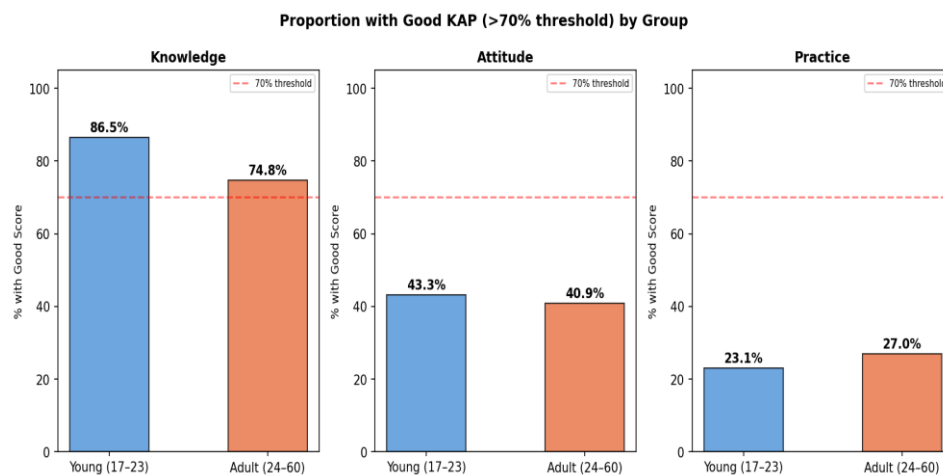


Figure 3: Proportion with Good KAP Scores

Figure 3: Percentage of respondents classified as 'Good' (>70% of domain max). Red dashed line = 70% benchmark. Practice falls far below the benchmark in both groups.

Moreover, marital status demonstrated a significant relationship with knowledge ($p = 0.023$) as well as attitude ($p = 0.003$) toward BSE, implying the possible role of societal as well as individual responsibilities in contributing to awareness as well as attitude towards the disease. Nevertheless, no significant association was found between the age of the respondents and knowledge, attitude, or practice related to BSE.

In general, the application of results from the graphical analysis has further emphasized the requirement for developing an intervention strategy that aims at closing the gap between awareness and practice, with more attention paid to the development of behavioural change strategies.

8. Significance of the Study

This study would give a baseline data regarding knowledge, attitude, and practice (KAP) concerning BSE for early detection of breast cancer in young female students (not from the health-care profession) and adult females in Pune, Maharashtra.

Through this study, we can be able to identify the disparities between these two groups and hence come up with health education measures for those who need them most by identifying socio-demographic strata such as age, marital status, educational status, and socio-economic status that need this intervention.

The results from this study would be used to design health education modules for female students within the universities and colleges and also among the adult females in accordance with the national breast cancer control strategy such as NPCDCS breast-cancer early detection campaign.

9. Limitations

This cross-sectional study prevents the establishment of any causal relationship between sociodemographic variables and KAP of breast self-examination; it only identifies associations. Self-report data collection is subject to possible recall bias, social desirability bias, and misunderstanding of questions, especially concerning knowledge and practice.

The selected sample consisted of urban and educated women in Pune city, which may limit its application in other settings where there are fewer educated women. The exclusion of senior individuals (above 60 years of age) is likely due to their lack of smartphones or computers, despite an increased likelihood of developing breast cancer with age.

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