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Regression Analysis of Determinants of Breast Self-Examination and Practices Among Midwifery Students in a Teaching Hospital, Nigeria

Umar N. Jibril[1*], Ali Hajara[2], Aminat G. Umar[3], Ibraheem M. Ayoade[4], Baba D. Abubakar[5], Aliyu Umar[6], Abdulmalik, N. Ajoke[7], Imam A. Abubakar[4], Lawal F.A. Ibrahim[1]

[1]*Department of Nursing Sciences, College of Health Sciences, University of Ilorin, Ilorin Nigeria*

[2]*College of Nursing Sciences, Abubakar Tafawa Balewa University Teaching Hospital, Bauchi Nigeria*

[3]*Department of Mathematics, College of Education (Technical) Lafiagi, Kwara State, Nigeria*

[4]*Department of Nursing Sciences, Al-hikma University Ilorin, Ilorin Nigeria*

[5]*Department of Health Promotion and Environmental Health Education, Faculty of Education, University of Ilorin, Nigeria*

[6]*Department of Nursing Services, National Hospital Abuja, Federal Capital Territory Nigeria*

[7]*Department of Nursing Sciences, College of Nursing Sciences, University of Ilorin Teaching Hospital, Nigeria*

Abstract

Globally, women are exposed to various forms of breast diseases, of which breast cancer poses a serious, devastating state of ill health. Efforts to control breast cancer focus on early detection through periodic breast examination for early diagnosis. This study assessed the Regression analysis of determinants of Breast Self-Examination and practices among 209 midwifery students at Tafawa Balewa University Teaching Hospital, Bauchi. A descriptive cross-sectional survey design was adopted using mixed methods for data collection. The data collected was analysed using descriptive statistics, chi-square, logistic regression and thematic analysis. Findings revealed that 61.0% students practiced BSE, and 66.0% of them opined that BSE enables the detection of breast abnormalities such as discharges and lumps. While students' barriers to consistent BSE were: poor knowledge about BSE (48.0%), lack of time (60.0%), and privacy (48.0%) in practicing BSE. Furthermore, exercise (OR = 1.844, $p < 0.05$) and family history of cancer (OR = 1.572, $p < 0.05$) significantly decreases the odd to practice BSE among students. This study concluded that students expressed reduction in breast cancer anxiety with mean = 2.51, std = 0.705, which explained a better understanding of BSE (mean = 2.61; std dev. = 0.623), while some perceived BSE as an effective means of early detection of breast cancers. We recommended that BSE practices should be given a high priority by students' midwives, as they are major health educators to females and women in the communities.

***Keyword**: Breast Self-examination, Midwifery Students, Practice of Breast Self-examination, Regression Analysis of Determinants of Breast Self-examination.*

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Corresponding Author: umaribna@gmail.com: umar.nj@unilorin.edu.ng

Introduction

Breast Self-Examination (BSE) is highly rewarding but yet commonly neglected by women, even though it is considered to be one of the screening methods in detecting early stage of breast cancer, breast self-examination is a useful technique recommended for practiced every month by women above 20 years, considering that breast cancer globally contributed to 685,000 deaths among women [1]. The WHO reported that out of 2.3 million women diagnosed of breast cancer, 670,000 women died worldwide making it a devastating disease that has no vaccine yet, but can be prevented through early diagnosis and treatment with the help of Breast Self-Examination [2]. There is evidence that women who correctly practice BSE monthly are more likely to detect breast abnormalities, especially the lump, at the early stages of its development, and which lead to early diagnosis of breast cancer for better prognosis [3].

Breast self-examination is a screening method that can help empower, raise awareness, and detect breast abnormalities among females, and it is a convenient and effective way to detect breast abnormalities. Regular BSE practice has been found to improve breast cancer awareness, early diagnosis, and treatment results [4]. Despite efforts to increase awareness for early detection, many females still face challenges of performing regular breast self-examinations [5]. A study in Saudi Arabia found a need to implement a women's health information campaign among adolescent females to expand their awareness of BSEs. Proper education of females, especially midwifery students, about early detection methods for breast cancer, including BSEs, could assist in increasing their awareness and participation in preventive measures before they reach the age group for mammography screening [6].

Midwifery students who are future healthcare providers, in the communities have an important role to play in female reproductive health especially in providing breast health education to improve breast cancer prevention and early detection among women in communities [7]. Therefore, practicing regular BSE among midwifery students can help them become familiar with examination of breasts to detect any abnormalities early, and subsequently leading to earlier detection of breast cancer for improved breast care outcomes [8]. Studies have shown that many healthcare professionals including midwifery students, lack adequate training and confidence in performing breast self-examination especially, on a study which reported that, nursing students were aware of breast self-examination. Still, their actual rates of practice were low [9, 10]. This raises concerns about whether midwifery students who possess similar knowledge but lack the skills to perform regular breast self-examination [11].

Midwifery students in Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH) Bauchi, have severally complained about their breast abnormalities, and many reported at the teaching hospital Bauchi for breast examinations. On our direct contact with some midwifery students at their different level of academic programme, it was observed that most could not clearly explain their involvement in practicing BSE using various methods which we felt might be due to their low levels of BSE practice and perception effect of BSE, despite their professional training. In this regard we attempted to conduct a study aimed to assess the relationship between determinants of Breast Self-Examination and practices among Midwifery Students at University Teaching Hospital, Bauchi.

Objectives are to:

1. Examine the breast Self-Examination practices among Midwifery Students in ATBUTH Bauchi.
2. Assess the determinants of BSE practices among midwifery students in ATBUTH Bauchi.

3. Explore the perceived effects of BSE among midwifery students in ATBUTH Bauchi.

Research Hypothesis

$H0_1$: There is no significant relationship between social demographic characteristics and practices of breast self-examination among midwifery students in ATBUTH Bauchi

$H0_2$: There is no significant linear relationship between factors influencing BSE and its Practice among Midwifery Students in ATBUTH, Bauchi

Methodology

This study is a cross-sectional research design using a mixed-method approach, amongst students selected from ATBU Teaching Hospital Bauchi. The population for this study comprises of students drawn from the Teaching Hospital School of midwifery Bauchi. The study population distribution was based on their levels of study; year three students 122, year two 115, and year one 124, giving a total population of 361 student midwives (School Registrar; 2024).[12] The sample size of 190 students was determined using Taro Yamane's formula, however, allowance for 10 percent attrition rate was made, given study population of 209. A purposive sampling technique was used to select students that constituted the study population, and researchers designed questionnaire was the instrument used for data collection based on the study objectives. A mixed method of descriptive quantitative using questionnaire while collection of qualitative data was done through the use of A question guide checklist for focus group discussions respectively.

The questionnaire consisted of four sections (A-D). Section A contained social demographic characteristics; B, breast self-examination practice and techniques; C, factors that determine the practice of breast self-examination; and D, perceived effects of BSE among students. Sections C and D adopted a 5point Likert scales type format for data gathering. While the Focus Group Discussion (FGD) was used to collect qualitative data, each session of FGD was conducted in three separate quiet classrooms. three groups with 8 participants each was selected from different levels of study. A question guide check list based on the research objectives was used to facilitate the discussions and the discussions were audio-recorded following informed consent sort from the participants.

Data Collection

Following the ethical approval from Human Research Ethical Committee of ATBU teaching hospital Bauchi, with approval REC NO. 001/2024, two research assistants were recruited and trained on the methods of data collection process and procedure at study setting. The research objectives were explained to the participants and they were assured of privacy and confidentiality of their responses and their participation is voluntarily as they can withdraw at any stage of the study. A convenient date and venue for meeting with the participants at the selected classes was scheduled. All information on the data collection procedure was discussed and an informed consent was obtained from students. On each day of data collection, we and trained research assistants met with the participants in each selected classroom at a scheduled time for the administration of questionnaire to the participants. The students were allowed appropriate time for responses. The completed questionnaires were duly checked for completeness to ensure no omission of any question item and sheet.

On the FGD, the discussion began with a self-introduction and the purpose of the research was explained to the students. The methods of data collection were explained to the students, the question item, which consisted of open-ended questions, was read out to the students, and they were given enough time to

respond to each question freely. The discussion was recorded with their consent and confidentiality was ensured with each session lasted an hour and the all process of data collection took a period of two weeks.

Data Analysis

A total of 209 questionnaires were administered, and 188 were correctly completed and used for analysis, yielding a response rate of 90%. The retrieved questionnaires were sorted, coded, and checked for errors in completion, and the analyses of the question items were subsequently conducted using Statistical Package for the Social Sciences (SPSS) version 25. Mean, frequency counts, percentage, and standard deviation, as well as Chi-square statistic, were employed for both descriptive and inferential analyses, respectively. While the qualitative data collected through focus group discussions was transcribed using thematic analysis in the following techniques;

Transcription and Coding: Audio recordings from the FGD were transcribed verbatim and transcripts were carefully read and coded based on the research questions.

Thematic Analysis: The coded data were organised and analysed to identify recurring patterns in participants' experiences and perceptions of the effects of BSE practices. Constant comparative analysis was employed to compare themes across groups (e.g., different levels of study and varying levels of BSE practice), and relevant quotes and excerpts from the transcripts were used to support and illustrate the identified themes.

Results

Table 1. Relationship between Social Demographic Characteristics and Practices of BSE among Midwifery Students in ATBUTH Bauchi

Demographic variables	**Categories**	**BSE Practice**		χ^2	**p-value**
		Yes	No		
Age of Respondents	17 – 20	34(18.1%)	23(12.2%0	2.042	0.360
	21 – 25	59(31.4%)	43(22.9%)		
	26 +	21(11.2%)	8(4.3%0		
Marital Status	Single	81(43.1%)	57(30.3%)		
	Married	32(17.0%)	16(8.5%)	1.044	0.593
	Divorced	1(0.5%)	1(0.5%)		
Current year of Study	First Year	40(21.3%)	25(13.3%)		
	Second Year	13(6.9%)	14(7.4%)	2.126	0.345
	Third Year	61(32.4%)	35(18.6%)		
Current Living Arrangement	On-campus housing	55(29.3%)	42(22.3%)	8.302	0.022*
	Off-Campus Housing (Rented	13(6.9%)	7(3.7%)		
	With family	46(24.5%)	25(13.3%)		
Ethnicity	Hausa	65(34.6%)	39(20.7%)	6.513	0.013*
	Yoruba	11(5.9%)	12(6.4%)		
	Igbo	7(3.7%)	6(3.2%)		
	Fulani	31(16.5%)	17(9.0%)		
Religious Affiliation	Islam	76(40.4%)	47(25.0%)	7.197	0.047*
	Christianity	38(20.2%)	27(14.4%)		
	Yes, Full time	4(2.1%)	3(1.6%)	0.328	0.849

Current Employment Status	Yes, Part time	12(6.4%)	6(3.2%)		
	No	98(52.1%)	65(34.6%)		
Approximate Monthly Salary	Below N20,000	6(24.0%)	1(4.0%)	2.265	0.519
	N20,000 – N50,000	4(16.0%)	4(16.0%)		
	N50,000 – N100,000	2(8.0%)	1(4.0%)		
	N100,000 +	4(16.0%)	3(12.0%)		

Source: Field Survey, 2024

Table 1 shows the socio-demographic characteristics of respondents, with a mean age of 33.5 years and the majority in the 21-25 age interval (54.3%). Most of the respondents (73.4%) are single and 52.0% of them live on campus. About 55.0% of students speak Hausa dialects, and 65.4% practice are Muslims. A larger proportion (86.7%) of them are unemployed, with only 28.0% earning N100,000 monthly under employment of government or private institutions. The table further shows the relationships between social demographic characteristics and BSE practices among the respondents. It is evident in the chi-square result that there exists a significant relationship between BSE practices and the current place of residence ($\chi^2 = 8.302, sig. = 0.022$), ethnicity ($\chi^2 = 6.513, sig. = 0.013$) and religion affiliation ($\chi^2 = 7.197, sig. = 0.047$)The three demographic variables are significant. The p-values are less than 0.05.

Table 2. Practices of BSE among Midwifery Students in ATBUTH Bauchi

Statement	**Options**	**Frequency**	**Percentage**
Have you ever practiced BSE?	Yes	114	60.6
	No	74	39.4
	Total	**188**	**100.0**
If yes, how often do you practice BSE?	Monthly	30	26.3
	Occasionally	58	50.9
	Rarely	26	22.8
	Total	**114**	**100.0**
if you have been practising BSE have you ever discovered any abnormality in your breast?	Yes	75	65.8
	No	39	34.2
	Total	**114**	**100.0**
What type of abnormality did you noticed?	Discharge	38	50.7
	Lump	37	49.3
	Total	**75**	**100.0**
If yes in the above, what did you do?	Prayed Over it	28	37.3
	Consult a medical practitioner	18	24.0
	Did nothing	29	38.7
	Total	**75**	**100.0**
When was the last time you performed BSE?	Less than two months ago	57	30.3

	Less than three months	67	35.6
	Six months	37	19.7
	One year ago,	18	9.6
	More than one year	9	4.8
	Total	**188**	**100.0**
What time of the day do you normally perform BSE?	Morning	66	35.1
	Evening	84	44.7
	Afternoon	38	20.2
	Total	**188**	**100.0**
Are you afraid to perform BSE?	Yes	135	71.8
	No	53	28.2
	Total	**188**	**100.0**

Source: Field Survey; 2024

Table 2 shows practice of BSE among students' midwives**,** 61.0% of students practiced breast Self-examination practices, 51% of them occasionally practiced BSE as against fewer number who practice BSE monthly. Little above average of students who practiced BSE, 51.0% of them noticed discharges and 49.3% observes lump in their breast respectively. In relation to the findings of FGD, all participants (8) in each of the 3 groups have knowledge about standard recommendation for BSE however, only 9 practice BSE and 18 did not, as 3 did not examined their breast consistently.

Table 3. Perceived Effect of BSE among Midwifery Students in the University Teaching Hospital, Bauchi

Statement	**Disagreed**	**Unsure**	**Agreed**	**Mean**	**Std. Dev.**	**Remark**
I feel more confident in my ability to detect breast abnormalities since starting BSE	38 (20.2%)	76 (40.4%)	74 (39.4%)	2.19	.750	Unsure
I have noticed any changes in my breast health since I started performing regular BSE	30 (16.0%)	46 (24.5%)	112 (59.6%)	2.44	.754	Unsure
I feel more in control of my breast health since I started BSE	31 (16.5%)	76 (40.45)	81 (43.1%)	2.27	.727	Unsure
I have experienced some reduction in breast cancer anxiety or worry since I started performing BSE	23 (12.2%)	46 (24.5%)	119 (63.3%)	2.51	.705	Agreed
I believe that BSE will help me develop a better understanding of my breast health	14 (7.4%)	45 (23.9%)	129 (68.6%)	2.61	.623	Agreed
I feel more empowered to take charge of my breast health since I started performing BSE	37 (19.7%0	107 (56.9%)	44 (23.4%)	2.04	.657	Unsure

Do you believe that BSE has helped you detect any breast abnormalities earlier than you would have otherwise?	39 (20.7%)	75 (39.9%)	74 (39.4%)	2.19	.755	Unsure

Source: Field Survey, 2024.

NB: Item with mean score within the range: 0 – 1.49 = Disagreed; 1.50 – 2.49 = unsure; 2.50 - 3.0 = Agreed

The table above reveals that a large proportion of students have a positive perception of BSE as it affects their breasts. This was supported by 63.3% of students who expressed less worry and anxiety about breast cancer prevalence (mean = 2.51, std = 0.705), while about 67.0% agreed that BSE further facilitates a better understanding of their breasts (mean = 2.61, std dev. = 0.623). Subsequently, in focus group discussions, students observed that BSE gave them confidence and courage to examine their breasts, which reduces anxiety associated with practicing BSE.

Table 4. Logistic Regression Results of Factors Influencing BSE Practice among Midwifery Students

Factors	**Coeff.**	**S.E.**	**Wald**	**DF**	**Sig.**	**OR**
Family history of cancer	.452	.460	.968	1	.025	1.572
Lack of confidence	-.205	.415	.244	1	.622	.815
Limited guidance from healthcare providers	-.757	.503	2.260	1	.133	2.132
Forgetfulness	-.821	.483	2.886	1	.049	.440
Anxiety	-.532	.417	1.631	1	.202	.587
Cultural belief	.306	.425	.519	1	.471	1.358
Age	-.013	.038	6.109	1	.041	.987

Source: Field Survey, 2024.

The table above shows various factors that influence the practice of BSE among midwifery students in ATBUTH Bauchi, principal among these is family history of cancer, lack of confidence in BSE, limited guidance from healthcare providers, forgetfulness, anxiety, cultural beliefs, and age. In the FGD findings, cultural factors, privacy, lack of a standing mirror, time, and knowledge of the normal and abnormal breast top factors influencing practices of BSE are discussed. The students' ability to identify these factors could probably be linked to their educational exposure and knowledge level about practice of BSE. Furthermore, the logistic regression analyses of factors influencing BSE Practice among Midwifery reveals that family history of cancer (OR = 1.572, $p < 0.05$), forgetfulness (OR = 0.440, $p < 0.05$) and age (OR = 0.987, $p < 0.05$) are the significant factors among other factors that influence BSE practiced among midwifery students in this current study.

Discussion

This study on the relationship between determinants of Breast Self-Examination and practices among Midwifery Students at University Teaching Hospital, Bauchi, involved midwifery students with a mean age of 33.5 years, who constituted the majority (73.4%) and were not married, with an average of living in on-campus accommodation. this implies that this category of students is in their active reproductive age group. The majority of

students were of Hausa-speaking dialect who were Muslims, which is a reflection of the geographical location of the study setting (Northern part of Nigeria), where the majority of inhabitants are Muslims and speak Hausa language. The larger percentage of student were unemployed, due to their current educational status, however, few (28.0%) that are employed and earned N100,000 equivalent to 64 US Dollas as at the time of this study. This finding implies that the student's age, educational status, place of birth/school setting, ethnicity, religion, and employment status, determine their participation in BSE. This is similar to a study on the stages of behavioural adoption of breast self-examination among Malaysian women, with the largest age group being 35 to 40 years old (46.5%) and the least being 66 to 70 years old (2.1%) [11].

The breast self-examination practices among midwifery Students**,** in this study, also reveal that among 61.0% of students who practiced BSE, 41.2% practiced it occasionally, against 26.3% who practiced it monthly, which shows a low level of students' participation in BSE. Furthermore, about 68.0% of students who practiced BSE claimed to have identified abnormality in their breast, and others observed breast discharges and lumps in their breast. Similarly, the finding from FGD also shows very little students who practiced BSE, did not examine their breast consistently. This implied that despite the large number of student midwives with knowledge of WHO standard recommendation of BSE**,** only few were able to identified abnormality in their breast and consulted a medical practitioner after noticing this abnormality. Based on this recent finding, one will wonder why students' educational status does not positively influence their BSE practices. This current study finding was contrary to findings from a previous study on BSE practices among nurses, which found that a significant proportion were not consistent in BSE practice, contrary to a study in Aminu Kanu Teaching Hospitals, which found that 91% of nurses practiced BSE, and only 44 % of them practiced BSE monthly [12, 13]. But study conducted among Malaysian women disagreed with our current findings in terms of women awareness of symptoms of breast cancer, risk factors of breast cancer, methods of breast screening, best time for breast screening and perception of breast lump respectively [11].

On the factors influencing the practice of BSE among midwifery students in ATBUTH Bauchi, this study identified family history of cancer, lack of confidence, limited guidance from healthcare providers with the same proportion. However, forgetfulness (63.8%), anxiety (72.3%), and cultural beliefs (59.6%) were the most influential factors in students' practice of BSE. Relatively, the logistic regression identified factors influencing BSE Practice among Midwifery Students revealed that family history of cancer ($OR = 1.572$, $p < 0.05$), forgetfulness ($OR = 0.440$, $p < 0.05$) and age ($OR = 0.987$, $p < 0.05$) were the significant factors that influenced BSE practiced among midwifery students in this current study. This current study corroborates findings of other study on factors that influence the practice of BSE, in terms of academic level, knowledge of BSE, and perception of BSE. Specifically, respondents in third year were 5.58 times more likely to practice BSE than respondents in the first year (95% CI = 2.17–14.32).[14] This study Further identified cultural factors, privacy, lack of standing mirror in the toilet, lack of time and knowledge of the normal and abnormal breast as factors influencing the practice of BSE. These current findings agreed with findings by Al-Naggar et al (2011) who revealed age, exercise and family history of cancer significantly influenced the practice of BSE [11].

The perceived effects of BSE in this study reveal that the majority of students agreed to have experienced a reduction in anxiety level about the diagnosis of breast cancer (mean = 2.51, std = 0.705) following their BSE, which also helped in better understanding of their

breast condition (mean = 2.61; std dev. = 0.623). This finding was similar to students in focus group discussion who expressed their feelings of confident and willingness to examine their breast which was supported findings from previous study [15]. The findings from the current study also supported study findings which reported that younger women often face more aggressive and fast-growing breast cancers, and emphasized the need for early detection for breast lumps or cancer [8].

Practices of BSE in focus group discussion among 8 midwifery students three themes emerged from the discussion based on the research questions:

Theme 1: knowledge and skills on BSE practice

Two participants practice breast self-examination, while 6 participants claimed not practicing breast self-examination. Out of the 2 participants who practice breast self-examination, 1 did not examine her breasts consistently on a monthly basis. However, the group of 8 participants had the knowledge of standard recommendation of BSE. One of the 2 that practice breast self-examination stated that;

> *"I always examined my breast every month by standing in front of a mirror to assess for any abnormality as recommended".*

Theme 2: Educational Gaps

Based on the FGD with the group of 8 participants, cultural factors, privacy, lack of a standing mirror in the toilet, lack of time, and knowledge of the normal and abnormal breast are factors influencing the practice of breast self-examination. As stated by five (5) participants

> "*My culture frowned at exposure of breast in the presence of other people (colleagues) as an immoral act"*

Theme 3: confidence and empowerments on BSE

Based on the focus group discussion held with midwifery students, the identified perceived effects of breast self-examination include 2 participants indicate that;

> *"I feel more confident and encouraged while examine my breast, and I did that with minimal anxiety. Since I started practicing breast self-examination, I noticed changes in my breast during self-examination".* Another one of the students stated that; *"I feel more confident and encouraged in examining my breast because it is easy and less stress to me"*

The findings highlight the need for comprehensive breast self-examination education on the importance of periodic BSE practice and perception on cultural belief on breast self-examination among midwifery students at Abubakar Tafawa Balewa University Teaching Hospital Bauchi.

Conclusion

In this study, findings indicate that despite the high knowledge level of students about BSE, the practice of breast self-examination among midwifery students was not encouraging, even though the average number of students indicated their practices of BSE However, a very small number of students did not do so at frequent intervals as recommended by the WHO. This current study however showed significant relationship between BSE practice and current living arrangement of students' ethnicity and religion affiliation, while other socio-demographic characteristics has no significant relationship with BSE practice. This study further concluded that exercise, family history of cancer, forgetfulness and age were the significant factors that influenced BSE practiced among midwifery students respectively.

Recommendations

Based on the findings and conclusions of this study, the following recommendations were made:

1. Provide midwifery students with comprehensive training and hands-on experience on breast self-examination, and encourage feedback and support from instructors to enhance confidence.
2. Encourage midwifery students to practice breast self-examination regularly.
3. Incorporate cultural diversity training into the curriculum to address cultural beliefs, values, and encourage open discussions and address misconceptions about breast self-examination.
4. Develop strategies to help the students form habits, such as reminders or tracking systems.

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Conflict of Interest

There was no conflict of interest among the authors or any organization regarding the conduct of this study.

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