





University of Dongola

Faculty of Medicine and Health Sciences

Department of Community Medicine

RESEARCH PROPOSAL

Knowledge, Attitudes, and Practices Regarding Breast Self-Examination among Female Nursing Students at the University of Dongola, Northern State, Sudan, from September to November 2026

A Research Proposal Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor of Medicine and Bachelor of Surgery (MBBS)

Prepared by

Marwa Adel Khatmi Ornasir

Aya Shaker Amin Tawfeg

Supervisor

Mr. Ahmed Abdalhady Al-Sisi

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1. Introduction

1.1 Background

Breast cancer is the most commonly diagnosed cancer among women worldwide, with approximately 2.3 million new cases and 685,000 deaths recorded in 2020, and the burden is projected to rise in low- and middle-income countries, where delayed diagnosis, limited awareness and the absence of organized screening programmes are common [1]. In Africa, an estimated 70–90% of breast cancer cases are diagnosed at an advanced stage [2]. In Sudan, breast cancer is the most common cancer among women and the third most common cancer overall [3,4].

Breast self-examination (BSE) is a technique in which a woman visually inspects and manually palpates her own breasts and axillae to detect any lump, discharge, or change in the shape, size or skin texture of the breast [5]. It is simple, private, painless and cost-free, and it is promoted as a way of increasing breast awareness, not as a stand-alone screening test or a substitute for clinical or radiological assessment [2,5].

Knowledge, attitude and practice (KAP) studies describe what people understand about BSE, how they feel about it, and what they actually do. Regional studies repeatedly show that awareness of BSE is often moderate to high while correct and regular practice remains low. Among female university students in Gaza, 96.5% had heard of BSE and 69.8% knew the correct timing, yet only 31.4% practised it regularly [5]. In Sudan, 95.3% of female detainees in Khartoum considered BSE important, but 66.3% had poor knowledge of BSE and 95.5% had poor practice [6]; in Khartoum State, about 60% of women were unaware of BSE and only 7–8% practised it regularly [7]. Commonly reported barriers include not knowing the correct technique, absence of breast symptoms, fear of finding an abnormality, lack of time and embarrassment [5,6].

1.2 Problem Statement

Breast cancer in Sudan is frequently diagnosed at an advanced stage, which worsens prognosis, increases treatment costs and reduces survival [3,4]. BSE is a feasible, low-cost practice that could partly compensate for the limited availability of mammography services. However, in Khartoum more than half of the women studied had poor knowledge of breast cancer and over 95% practised BSE incorrectly, irregularly or not at all [6], and in another Khartoum study about 60% of participants were unaware of BSE and only 7–8% practised it regularly [7].

Female nursing students are expected to be role models and educators for their families, peers and future patients, yet studies among female health-sciences students show a persistent gap between knowledge and actual practice of BSE

[1,2,5].

Despite this, to the best of the authors' knowledge, no study has examined the knowledge, attitude and practice regarding BSE among female nursing students at the University of Dongola, and the factors associated with them are unknown. This lack of local evidence limits the ability of the Faculty to identify the real gaps and to plan appropriate education.

1.3 Rationale

Breast cancer is the leading cancer among Sudanese women and is usually detected late [3,4]. Because organized mammography services are not widely available [2,6], a simple and cost-free practice such as BSE can help women notice abnormalities early and seek care promptly, which makes it an important topic for early-detection efforts.

Measuring knowledge, attitude and practice together shows not only how much students know, but also whether favourable attitudes translate into correct and regular practice, and which gaps and barriers need attention [5,8]. Examining their association with age, academic year, family history and previous health education will show which groups of students need the most support.

The Faculty of Nursing was chosen because nursing students will soon become the nurses who teach women about BSE, so their own knowledge and practice directly affect the quality of breast health education in the community [1]. Structured teaching has been shown to improve BSE knowledge and practical competence among midwifery students [9], so baseline data from the Faculty can guide curriculum content and training. No such data are currently available for the University of Dongola.

1.4 Objectives

1.4.1 General objective

To assess the knowledge, attitude and practice regarding breast self-examination, and their association with selected socio-demographic factors, among female nursing students at the Faculty of Nursing, University of Dongola, Northern State, Sudan, from September to November 2026.

1.4.2 Specific objectives

1. To assess the level of knowledge regarding breast self-examination among female nursing students.
2. To assess the attitude towards breast self-examination among female nursing students.
3. To assess the practice of breast self-examination among female nursing students.

1.4.3 Hypotheses

Null hypothesis (H_0): There is no statistically significant association between the level of knowledge, attitude, or practice regarding breast self-examination and age, academic year, place of residence, family history of breast cancer, or previous breast health education among female nursing students at the University of Dongola.

Alternative hypothesis (H_1): There is a statistically significant association between the level of knowledge, attitude, or practice regarding breast self-examination and at least one of these factors ($p < 0.05$).

2. Summaries of Three Similar Published Studies

The three studies below are the closest to the present proposal in population, topic or setting.

Khalip et al. (Malaysia, 2021) [10]. This study assessed knowledge and attitude toward BSE among young adult nursing students in a public university in Malaysia. Among 188 undergraduate nursing students, 86.7% were aware of BSE, but only 33% reported practising it, and the authors identified relationships between educational characteristics and the KAP outcomes. It shows the awareness–practice gap in the same population as the present study.

Abo Al-Shiekh et al. (Gaza, 2021) [5]. This cross-sectional study included 86 female university students of Applied Medical Sciences. Although 96.5% had heard of BSE and 69.8% knew the correct timing, only 31.4% practised it regularly; the main barriers were having no breast problem and not knowing the technique. It is relevant because it measured the same KAP domains among female health-sciences students in an Arab setting.

Mohamed et al. (Sudan, 2020) [6]. This cross-sectional study among 330 female detainees in Khartoum found that 56.2% had poor knowledge of breast cancer and 66.3% poor knowledge of BSE; 95.3% considered BSE important, yet 95.5% had poor practice, and low education was associated with poor knowledge. It provides Sudanese evidence of the same gap between attitude and practice.

3. Materials and Methods

3.1 Study Design

An analytical, institution-based cross-sectional study.

3.2 Study Area

The study will be conducted at the Faculty of Nursing, University of Dongola, in Dongola, the capital of Northern State, Sudan.

3.3 Study Population

All female nursing students registered at the Faculty of Nursing, University of Dongola, during the study period.

Inclusion criteria:

- Female students.
- Aged 18 years or older.
- Registered at the Faculty of Nursing during the study period.

Exclusion criteria (among those who meet the inclusion criteria):

- Students who took part in the pretest of the questionnaire.
- Students who decline to participate or who do not complete the questionnaire.

3.4 Sampling

Sample size: The sample size will be calculated using the single population proportion formula, $n_o = Z^2p(1-p)/d^2$, with Z = 1.96 (95% confidence level), p = 0.5 and d = 0.05, which gives $n_o = 385$. The finite population correction, $n = n_o / (1 + (n_o - 1)/N)$, will then be applied, where N is the total number of registered female nursing students (N = ____, to be obtained from the Faculty registrar), giving n = ____. After adding 10% for non-response, the final sample size = ____ students.

Sampling technique: Stratified random sampling by academic level (the four years of the programme). The sample will be allocated proportionally to the number of students in each year, $n_i = (N_i / N) \times n$, and participants in each year

will be selected by simple random sampling from the Faculty registry list.

3.5 Methods of Data Collection

Data will be collected using a self-administered structured questionnaire of 20 questions (Annex I), adapted from validated tools used in similar studies [5,6,8,11–13]. It has four sections of five questions each: socio-demographic characteristics, knowledge, attitude and practice. The investigators will distribute the questionnaire during lecture hours and collect it on the same day.

Scoring: Knowledge: one point for each correct answer (0–5); a score of 60% or more (≥3) is good knowledge. Attitude: five-point Likert scale, total 5–25, with the negatively worded item reverse-coded; a score of 70% or more (≥18) is a favourable attitude. Practice: good if BSE is performed monthly, one week after menstruation (on a fixed day of the month for women who do not menstruate), using the pads of the three middle fingers; any other pattern, or no practice, is poor.

Validity and reliability: The questionnaire will be pretested on 5% of the sample size among students who are not part of the study sample, and its reliability will be assessed using Cronbach's alpha (≥0.60 considered acceptable).

3.6 Study Variables

Independent variables: age, academic year, place of residence, family history of breast cancer, and previous breast health education.

Dependent variables: level of knowledge of BSE (good / poor), attitude towards BSE (favourable / unfavourable), and practice of BSE (good / poor), as defined in Section 3.5.

3.7 Data Analysis

Data will be entered and analysed using SPSS version 26. Descriptive statistics (frequencies, percentages, means and standard deviations) will summarise the variables. The chi-square test (or Fisher's exact test when expected cell counts are below 5) will be used to assess the association between the socio-demographic variables and the level of knowledge, attitude and practice, and binary logistic regression will be used to identify independent associations (odds ratios with 95% confidence intervals).Variables with a p-value < 0.25 in the bivariate analysis (chi-square or Fisher's exact test) will be entered into the multivariable binary logistic regression model, separately for each outcome (knowledge, attitude and practice). Age will be analysed as a categorical variable (≤ 20 years vs. > 20 years). Model fit will be assessed with the Hosmer–Lemeshow goodness-of-fit test, and adjusted odds ratios (AOR) with 95% confidence intervals will be reported. A p-value below 0.05 will be considered statistically significant. Results will be presented in tables and charts.

3.8 Ethical Clearance

- Approval of the university administration / scientific affairs will be obtained before data collection.
- Permission will be obtained from the Dean of the Faculty of Nursing.
- Verbal / implied consent: a short statement at the beginning of the questionnaire explains the purpose of the study and states that participation is voluntary and anonymous; completing and returning the questionnaire implies consent. No separate paper consent form will be used.

3.9 Research Plan

The study will be carried out by the two investigators under the supervision of Mr. Ahmed Abdalhady Al-Sisi, in the following steps:

- Preparation of the proposal and literature review.
- Obtaining the approvals of the university administration and the Faculty of Nursing.
- Preparation and pretest of the questionnaire.
- Data collection from the selected students.
- Data entry, cleaning and analysis.
- Report writing and submission of the final research report.

3.10 Time-line

The study will be completed within three months, from September to November 2026, and the final report will be submitted by the end of November 2026.

Table 1. Study time-line, September – November 2026

Activity	Sep	Oct	Nov
Proposal preparation and literature review	✓		
Approvals (university administration and Faculty of Nursing)	✓	✓	
Questionnaire preparation and pretest		✓	
Data collection		✓	
Data entry, cleaning and analysis		✓	✓
Report writing and final submission			✓

3.11 Budget Breakdown

Table 2. Estimated budget (Sudanese Pounds, SDG)

Item	Quantity	Unit cost (SDG)	Total (SDG)

Item	Quantity	Unit cost (SDG)	Total (SDG)
Printing and photocopying of questionnaires	300	1,000	300,000
Stationery (pens, clipboards, folders, collection box)	1	100,000	100,000
Expert panel review (coordination and communication, 4 experts)	4	25,000	100,000
Statistical consultation and SPSS access	1	100,000	100,000
Transport and communication for data collection and follow-up	1	200,000	200,000
Internet and data for literature search and correspondence	4	100,000	400,000
Report printing and binding (5 copies)	5	20,000	100,000
Seminar materials (slides, poster printing)	1	100,000	100,000
Subtotal			**1,400,000**
Contingency (10%)			140,000
Total estimated cost (SDG)			**1,540,000**

Funding source: the study will be self-funded by the investigators, with logistic support from the Department of Community Medicine, Faculty of Medicine and Health Sciences, University of Dongola.

4. References

References are numbered in the order in which they are first cited in the text (Vancouver style).

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Annex I: Research Questionnaire

Title: Knowledge, Attitudes, and Practices Regarding Breast Self-Examination among Female Nursing Students at the University of Dongola, Northern State, Sudan

Investigators: Marwa Adel Khatmi Ornasir; Aya Shaker Amin Tawfeg |
Supervisor: Mr. Ahmed Abdalhady Al-Sisi

Consent statement: This questionnaire is part of a research study on breast self-examination (BSE) among female nursing students at the University of Dongola. Participation is voluntary and anonymous; no names will be recorded and the data will be used for research purposes only. Completing and returning this questionnaire means that you agree to participate.

Instructions: Please answer all questions honestly and tick (✓) the option that best applies to you. Completion time: about 5–10 minutes.

Section One: Socio-demographic Characteristics

#	Question	Response
1	Age in completed years	_____ years
2	Academic year	☐ Year 1 ☐ Year 2 ☐ Year 3 ☐ Year 4
3	Place of residence	☐ Urban ☐ Rural ☐ On-campus hostel
4	Family history of breast cancer (first- or second-degree relative)	☐ Yes ☐ No ☐ Do not know
5	Have you previously received education or training about breast health or BSE?	☐ Yes ☐ No

Section Two: Knowledge

#	Question	Response
6	BSE is a method in which a woman examines her own breasts to detect any abnormality.	☐ True ☐ False ☐ Do not know
7	At what age should a woman start BSE?	☐ 20 years ☐ 30 years ☐ 40 years ☐ After menopause ☐ Do not know
8	How often should BSE be performed?	☐ Daily ☐ Weekly ☐ Monthly ☐ Yearly ☐ Do not know
9	What is the best time in the menstrual cycle to perform BSE?	☐ During menstruation ☐ One week after the end of menstruation ☐ Before menstruation ☐ Any time ☐ Do not know
10	A breast lump, nipple discharge, or a change in the shape or skin of the breast may be a warning sign of breast cancer.	☐ True ☐ False ☐ Do not know

Section Three: Attitude

SA = strongly agree, A = agree, N = neutral, D = disagree, SD = strongly disagree.

#	Statement	SA	A	N	D	SD
11	Regular BSE is important for early detection of breast cancer.	☐	☐	☐	☐	☐
12	All women should perform BSE every month.	☐	☐	☐	☐	☐
13	Performing BSE is embarrassing to me.	☐	☐	☐	☐	☐
14	I feel confident that I can perform BSE correctly.	☐	☐	☐	☐	☐
15	I would seek medical advice immediately if I found an abnormality during BSE.	☐	☐	☐	☐	☐

Section Four: Practice

#	Question	Response
16	Have you ever performed BSE?	☐ Yes ☐ No
17	How often do you perform BSE?	☐ Weekly ☐ Monthly ☐ Occasionally ☐ Rarely ☐ Never
18	When do you usually perform BSE?	☐ One week after the end of menstruation ☐ During menstruation ☐ Before menstruation ☐ Any time ☐ Not applicable
19	Which technique do you use?	☐ Pads of the three middle fingers ☐ Fingertips only ☐ Pressing with the whole palm ☐ Visual inspection only ☐ Do not know the correct technique
20	If you do not perform BSE regularly, what is the main reason?	☐ Do not know how ☐ No time ☐ Fear of finding an abnormality ☐ No symptoms ☐ Embarrassment ☐ Forgetfulness ☐ Other: _____

Thank you for your participation.