Provisionally accepted for publication

ORIGINAL ARTICLE

The effect of education based on cooperative learning, problem-solving, role-playing, and video-based instruction on knowledge, attitude and practice related to breast self-examination in women

Cooperative learning, problem-solving, role-playing, video-based to breast self-examination

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Doi: 10.36129/jog.2025.242

ABSTRACT

Objective. Breast self-examination is a healthy and non-invasive way to predict breast cancer. This research investigates education based on cooperative learning, problem-solving, role-playing, and video-based instruction on knowledge, attitude, and practice related to breast self-examination in women in Iran in 2024.

Materials and Methods. This quasi-experimental study included 165 Iranian women. The intervention group consisted of 132 individuals, divided into four groups of 33. Each group attended two educational sessions, each lasting 60 minutes. Using a questionnaire, demographic, anthropometric, and knowledge, attitude, and practice. The data obtained from the survey was analyzed by using group statistics, independent sample test, paired sample test, chi-square test, and ANOVA.

Results. The mean age of the women was 25.20±3.00 years. The mean scores in knowledge (95% CI F=8.46; P<0.001) in all education groups improved post-intervention. The average rates of attitude and practice in all education groups did not show a significant increase in post-

intervention (95% CI F=2.30; P>0.05). The mean scores on attitude and practice did not improve in the control group (95% CI, P>0.29).

Conclusions. There was a general knowledge about breast cancer and breast self-examination; poor attitude to doing breast self-examination and wrong practice of breast self-examination among all the women recruited at baseline, irrespective of the group.

Key words

Breast self-examination; education; role-playing; problem-solving; cooperative learning.

Introduction

Breast cancer is a widespread cancer affecting women globally. In 2020, the World Health Organization reported about 2.3 million diagnoses and 685,000 deaths from the disease[1].In Iran, breast cancer is one of the most common cancers. According to the National Cancer Registry System, the relative frequency among Iranian women was 25 percent in 2015 and rose to 26.4 percent in 2017, indicating a continued increase in cases[2].

To detect breast cancer early, three methods have been suggested, including mammography, CBE[1] and BSE[2].Among these, BSE is a non-invasive, cost-effective, and easy-to-perform method for detecting breast cancer[3].

About one-third of breast cancers occur in women under 50, where mammography may be less effective. In these cases, self-examination can be a valuable method for early detection[4]. Proper education on breast self-examination (BSE) is fundamental as 90% of breast lumps are detected by individuals [5]. Breast self-examination (BSE) is effective when women are knowledgeable and skilled in performing it correctly[6].

[1] clinical breast examination
[2] breast self-examination

Studies in Iran show that women's knowledge of breast cancer symptoms and the effectiveness of BSE as an early diagnostic tool is very low[7, 8]. Different educational methods for Breast Self-Examination (BSE) yield varying results. Various information sources enhance understanding of breast cancer and BSE. Some studies suggest that video instruction improves BSE skills, while others find face-to-face education more effective[9].Most previous studies have compared group discussions and lectures [10, 11].To date, no study has examined the simultaneous effects of active learning methods like role-playing and problem-solving, which have gained importance in education recently. Additionally, few studies have compared their effectiveness to inactive methods.

The purpose of this study was to investigate the effect of four educational methods, including cooperative learning, problem-solving, role-playing, and video-based instruction, on knowledge, attitude, and practice of breast self-examination in 20 to 30-year-old women in Iran in 2024.

Materials and Methods

Participant

This quasi-experimental study, conducted in 2024 in Iran, involved 165 women using a cluster-random sampling method:

1. **Define the Population**
2. **Identify Clusters**: The population was divided into natural groups, such as health centers .
3. **List Clusters**: A register of community health centers was created.
4. **Randomly Select Clusters**: Eight health centers were randomly chosen for participation
5. **Collect Data**: Data was gathered from all eligible women in the selected clusters.

The educational programs delivered included cooperative learning, problem-solving, role-playing, and video-based instruction.

The inclusion criteria

Aged 20-30, married, seeking family planning services, willing to participate, not pregnant, Iranian.

Sample size

The sample size was calculated using the formula for a quasi-experimental survey [12] with a margin of error = 0.05. Considering the 10% probability of case attrition, Participants were 165 women.

$$n = \frac{\left(z_{1-\alpha/2} + z_{1-\beta}\right)^2 (\partial_1^2 + \partial_2^2)}{(\mu_1 - \mu_2)2}$$

Participants

The intervention group comprised 132 individuals divided into four groups of 33. Each group participated in two educational sessions, with each session lasting 60 minutes. In contrast, the control group consisted of 33 individuals who attended a standard educational session at healthcare centers focused on breast self-examination. One month after the intervention, both the intervention and control groups completed the questionnaires again.

Measure tools

The data collection tools of the multiple-choice questionnaire included demographic data (16 questions), knowledge (20 questions), attitude (15 questions), and practice (6 questions). The validity and reliability of the questionnaires had been established in previous studies (14,16). Therefore, there was no need for re-evaluation of validity and reliability(CVI= 0.99, CVR= 0.85)[14-15].

Knowledge

It included 20 questions about BSE. The scores of 1 and 0 were assigned to true and false responses. The items had high external consistency (Cronbach's α = 0.93) [14-15].

Attitude

This scale had 15 items; indirect attitude assessed ranging from “disagree strongly” to “agree strongly” (−2–+2). The items had high internal consistency (Cronbach’s α = 0.85) [14-15].

Practice

This scale had 3 items, items ranging from “disagree strongly” to “agree strongly” (−2–+2). The items had high internal consistency (Cronbach’s α = 0.80) [14-15].

Educational intervention

The educational content was sourced from the "Package of Basic Interventions for Non-Communicable Diseases in Iran's Primary Health Care System (IRAPEN)" by the Ministry of Health. It included an educational pamphlet and a PowerPoint based on a knowledge questionnaire, organized into two main sections (1). Theoretical training included four parts: Breast neoplasm (prevalence, incidence, and risk factors), prevention (self-care, diagnosis), and concepts and methods of Breast Self-Examination (BSE). Topics covered include breast cancer biology, statistics, epidemiology in Iran and globally, modifiable and non-modifiable risk factors, preventive measures, and self-protection skills. The practical section demonstrated the application and steps of BSE.

In the first session, members shared their BSE experiences, guided by the educator to foster positive opinions and attitudes. This indirect approach aimed to encourage discussions among spouses and shift negative attitudes toward BSE.

Post-test was administered one month after receiving the education.

Data analysis

The data was analyzed using SPSS 24. The results of the Shapiro-Wilk test indicated that the significance levels obtained for the study variables, separated by the intervention and control groups, were all greater than 0.05. Therefore, the assumption holds, and it is permissible to

perform parametric tests. In the next step, the prerequisite of equality of variances was examined using Levene's test, and the assumption of homogeneity of variances was confirmed (P-value > 0.05). The T-test, Paired t-test, ANOVA test, and Chi-square test were done. A significance level of $P < 0.05$ was considered for all tests.

Results

The results showed that there were no significant differences in demographic information among the groups (P=0.869)(Table 1).

The mean (standard deviation) of the knowledge scores of the participants in the problem solving, cooperative learning, role playing, educational video, and control groups showed a significant difference before and after the intervention ($p<0.001$)(Table 2).
As the results of the analysis of ANOVA showed, in the variable of knowledge, the effect of the intervention on the post-test scores is significant (P-value <0.001).In the attitude, after adjusting for the effect of pre-tests, the effect of group on the post-test scores is not significant (P=0.06). In the practice, after adjusting for the effect of pre-tests, the effect of group on the post-test scores is not significant (P=0.54)(Table 3).

Discussion:

The mean scores in knowledge in all education groups improved post-intervention. A study by Mena et al. (2014) found that many women in rural and semi-urban Ghana lack awareness of Breast Cancer and its risk factors, with 67.6% of rural women lacking knowledge about its causes[16].

Molly and Mercy (2016)[17] conducted a quasi-experimental study among Mahila Mandal rural women in Mugalur, Bangalore, revealing that participants had low baseline knowledge scores

on breast self-examination (BSE). They gave many incorrect responses about the frequency of BSE practice, detection methods, and stages of breast cancer. The study revealed that baseline attitudes toward breast self-examination (BSE) were generally poor, with mean scores ranging from 41.93 to 44.61. Education alone may not sufficiently address the fears and anxieties women associate with BSE, such as the fear of finding abnormalities. Emotional barriers, including fear, embarrassment, and cultural beliefs, influence attitudes and require more than just information to overcome. Misconceptions about breast health persist, highlighting the need for ongoing education. Additionally, some women may doubt the effectiveness of BSE compared to mammography, necessitating a focus on how BSE complements other screening methods. Education must be culturally sensitive and address specific barriers to acceptance. Even with education, some women may procrastinate on regular self-examinations, indicating a need for continuous reminders. Overall, improving attitudes toward BSE requires a multifaceted approach that considers emotional, cultural, and logistical factors, along with collaboration among healthcare providers and community organizations. Similar studies have been reported in this regard in 2024 and 2025.[18, 19]

Jeihooni et al. (2023)[20] and Ibitoye and Thupayegale-Tshwenegae (2021)[21] found that women had a positive attitude towards adopting BSE, despite both studies being cross-sectional. Notably, most participants were keen to educate others about BSE benefits and techniques, a finding consistent with our study, which also highlighted women's willingness to share their knowledge.

Nisha and Murali (2020)[22] noted that training interventions, including self-demonstration, could boost motivation and attitudes toward breast self-examination (BSE). However, in present study found no initial differences between the educational and control groups. Post-intervention, the mean practice scores for BSE were not significant across all educational methods (problem solving, cooperative learning, educational video, role playing). In certain studies where poor

BSE practice has been reported, it has been linked to the education level of the respondents and their partners. For example, Pilehvarzadeh et al. (2015) [23] found that there is a significant correlation between educational attainment and BSE performance. After the intervention, the average practice score of the cooperative learning, problem-solving, and video training group showed a significant increase (P<0.05), while the role-playing group and control group did not show a significant change. In their study, Sultan Çelik et al[24]found that women with visual impairments benefit from watching a breast self-examination training video with an audio description before performing self-examinations.

Molly and Mercy (2016)[17] attributed the lack of adoption and practice of BSE to a lack of knowledge and skills required for self-examination.

After the intervention, the average practice score of the cooperative learning, problem-solving, and video training group showed a significant increase (P<0.05), while the role-playing group and control group did not show a significant change. Libretti in a study in 2023 showed that the quality and reliability of hysteroscopy videos on the platform are poor. The strategic use of selected, high-quality hysteroscopy videos can enhance procedure success and alleviate patient fears[25] which is consistent with the findings of the present study.

Limitations and suggestions

The study was conducted in selected wards of Torbat Jam, which means the findings may not be representative of the entire country. Additionally, the proportion of women practicing breast self-examination (BSE) was based on self-reported responses. Other important aspects of BSE practice, such as frequency, timing, and technique, were not considered when identifying the factors associated with BSE. Therefore, we recommend that training be provided to women to improve their attitudes toward BSE. Further research should also be conducted to identify the factors that hinder the practice of BSE so that these barriers can be effectively addressed.

Conclusions

Participants showed general knowledge about breast cancer and BSE, but had a poor attitude and incorrect practices regarding BSE. The findings highlight the need to disseminate this information widely and implement state policies for educational programs on BSE within community health interventions. Non-governmental organizations should utilize these findings to develop effective breast cancer control programs at the community level. This must be done via massive exposure to the primary stakeholders and decision makers in such groups.

COMPLIANCE WITH ETHICAL STANDARDS

Author contributions

F.A.: Supervision, conceptualization, methodology, project administrator.Z.J.: Conceptualization,visualization, methodology,formal analysis, investigation, writing - original draft, review & editing. S.ZS.:Methodology,

Funding

N/A

Study registration

N/A.

Disclosure of interests

The authors declare no competing interests

Ethical approval

Ethical approval in this study was obtained, and all procedures performed on human samples were conducted following the relevant guidelines and regulations of the Helsinki Declaration. The study protocol was approved by the Research Ethics Committee (IR.TRJUMS.REC.1403.005) in Torbat Jam in Iran.It is worth noting that participation in this study was completely voluntary and after full awareness of the research aims and method and other treatment options. Also, informed written consent was obtained from the legal guardians of all patients before entering the study.

Informed consent

All authors consent to the publication of the manuscript.

Data sharing

The data that support the findings of this study are available from the corresponding author upon reasonable request**.**

Acknowledgements

We want to thank of the Non-Communicable Diseases Research Center, Deputy of Research and Technology of Sabzevar University of Medical Sciences, Sabzevar, Iran.

We also want to thank the Deputy of Research and Technology of Torbat Jam University of Medical Sciences, Torbat Jam, Iran.

References:

1.Fahad Ullah M. Breast cancer: current perspectives on the disease status. Breast Cancer Metastasis and Drug Resistance: Challenges and Progress. 2019:51-64. .http://dx.doi.org/10.1007/978-3-030-20301-6_4

2.Haghighat S, Omidi Z, Ghanbari-Motlagh A. Trend of Breast Cancer Incidence in Iran During A Fifteen-Year Interval According To National Cancer Registry Reports. IJBD. 2022;15(2):4-17.doi.org/10.30699/ijbd.15.2.4

3.Yu J, Gao Y, Wang H, Liu B, Zhang S. Structural equation modeling analysis of determinants of barriers to breast self-examination among Eastern Chinese women. Plos one. 2023;18(3):e0283525.doi: 10.1371/journal.pone.0283525. PMID: 36961804; PMCID: PMC10038294.

4.Salmanian H. Knowledge and practice about breast self examination in women who referred to Babol health centers, Mazandaran, Iran. Hormozgan Med J.2006;9(4):291-95.

5.Sadeghnezhad, F., S. Niknami, and M. Ghaffari, *Effect of health education methods on promoting breast self examination (BSE).* Journal of Birjand University of Medical Sciences, 2008. 15(4): p. 38-48.

6.Saslow D, Boetes C, Burke W, Harms S, Leach MO, Lehman CD, et al. American Cancer Society guidelines for breast screening with MRI as an adjunct to mammography. CA: Cancer J Clin. 2007;57(2):75-89.doi.org/10.3322/canjclin.57.2.75

7.Albeshan S, Shubayr N, Alashban Y. Assessment of Knowledge and Awareness About Breast Self-Examination Among University Female Students in Saudi Arabia. Breast Cancer: Targets and Therapy. 2023:91-9.doi: 10.2147/BCTT.S396903. PMID: 36755689; PMCID: PMC9900142.

8.Hassan NA. Awareness toward breast cancer and practice of breast self-examination among Iraqi female students at faculty of basic education. J Adv Pharm Tech Res. 2023;14(3):248.doi.org/10.4103/japtr.japtr_281_23

9.Hoinoiu T, Piţ D, Oprean C, Hoinoiu B, Diaconescu A, Grujic L, et al. Risk factors for breast cancer recurrence in postmenopausal women: a bibliometric study. Frontiers in Oncology. 2025;15:1522713.

10.Charalampopoulou M, Tamiolaki EE, Tryfonopoulos D, Bletsa G, Tsakogiannis D, Tzioga L, et al. The Impact of Lifestyle Medicine on Quality of Life in Female Breast Cancer Survivors: A Systematic Review. American Journal of Lifestyle Medicine. 2025:15598276251334325. https://doi.org/10.1177/15598276251334325

11. Burciu OM, Sas I, Merce A-G, Cerbu S, Moatar AE, Merce A-P, et al. Comprehensive Analysis of Predictors and Outcomes in Breast Cancer Screening in Romania: Insights from Demographic, Clinical, and Lifestyle Factors. Journal of Clinical Medicine. 2025;14(5):1415. https://doi.org/10.3390/jcm14051415

12.Savabi-Esfahani M, Taleghani F, Noroozi M, Tabatabaeian M. Role playing for improving women's knowledge of breast cancer screening and performance of breast self-examination. APJCP. 2017;18(9):2501.doi: 10.22034/APJCP.2017.18.9.2501. PMID: 28952284; PMCID: PMC5720657.

13. Denkert C, von Minckwitz G, Darb-Esfahani S, Lederer B, Heppner BI, Weber KE, et al. Tumour-infiltrating lymphocytes and prognosis in different subtypes of breast cancer: a pooled analysis of 3771 patients treated with neoadjuvant therapy. The lancet oncology. 2018;19(1):40-50.doi: 10.1016/S1470-2045(17)30904-X. Epub 2017 Dec 7. PMID: 29233559.
14. Mena M, Wiafe-Addai B, Sauvaget C, Ali IA, Wiafe SA, Dabis F, et al. Evaluation of the impact of a breast cancer awareness program in rural Ghana: A cross-sectional survey. Int J Cancer. 2014;134(4):913-24.doi.org/10.1002/ijc.28412. Epub 2013 Aug 29. PMID: 23913595.
15. Molly J, Mercy P. Effectiveness of a structured teaching programme on knowledge of breast cancer and skill of breast self-examination: a quasiexperimental study in rural women. Int J Community Med Public Health. 2016;3(10):2940-3.doi.org/10.18203/2394-6040.ijcmph20163387
16. Mena M, Wiafe-Addai B, Sauvaget C, Ali IA, Wiafe SA, Dabis F, et al. Evaluation of the impact of a breast cancer awareness program in rural Ghana: A cross-sectional survey. International journal of cancer. 2014;134(4):913-24. https://doi.org/10.1002/ijc.28412
17. Molly J, Mercy P. Effectiveness of a structured teaching programme on knowledge of breast cancer and skill of breast self-examination: a quasiexperimental study in rural women. Int J Community Med Public Health. 2016;3(10):2940-3. https://doi.org/10.18203/2394-6040.ijcmph20163387

18. Sonnenfeld MM. Gynæcology & Obstetrics. Ital J Gynaecol Obstet. 2025;37(1).
19. Matteo L, Stefano D. Gynæcology & Obstetrics. Ital J Gynaecol Obstet. 2024;36(4).
20. Alinejad N, Bijani M, Malekhosseini M, Nasrabadi M, Harsini PA, Jeihooni AK. Effect of educational intervention based on health belief model on nurses' compliance with standard precautions in preventing needle stick injuries. BMC nursing. 2023;22(1):1-10. https://doi.org/10.1186/s12912-023-01347-0
21. Pilehvarzadeh M, Rezie H, Reza M, Aflatoonian F, Mashayekhi F. Knowledge and attitude of women about breast self-examination. Breast. 2015;36(40.4):23.5.doi.org/10.13005/bbra/1625
22. Çelik S, Çalım Sİ. The Effect of a Training Video With Audio Description on the Breast Self-Examinations of Women With Visual Impairments. J Vis Impair Blindness. 2023;117(1):87-98.doi.org/10.1177/0145482X221150906
23. Libretti, A., et al., *Hysteroscopy in the new media: quality and reliability analysis of hysteroscopy procedures on YouTube™.* Archives of gynecology and obstetrics, 2023. 308(5): p. 1515-1524.https://doi.org/10.1007/s00404-023-07172-9

Table 1. Characteristics of the participants in the study according to the studied groups.

	Group					**P-value**
	Control N=33	**role playing N=33**	**Educational video N=33**	**cooperative learning N=33**	**Problem solving N=33**	
Age (mean and standard deviation)	24(4)	28(1)	24(3)	24(5)	26(2)	0.869*
Marital status (frequency and frequency percentage)						
Single	6(18.1)	9(27.2)	3(9.00)	13(39.3)	7(21.2)	0.206^
married	27(81.8)	22(66.6)	29(87.8)	18(54.5)	25(75.7)	
deceased wife	0(0)	1(3.00)	0(0)	0(0)	0(0)	
divorced	0(0)	1(3.00)	1(3.00)	0(0)	0(0)	
Unknown	0(0)	0(0)	0(0)	2(6.00)	1(3.00)	
Literacy status (frequency and frequency percentage)						
illiterate	0(0)	0(0)	5(15.1)	0(0)	0(0)	0.10^
Elementary to third middle school	12(36.30)	13(39.30)	14(42.40)	7(21.20)	13(39.30)	
High school to diploma	7(21.20)	9(27.20)	8(24.20)	12(36.30)	15(45.40)	
Diploma to post-diploma	2(6.00)	2(6.00)	0(0)	7(21.20)	3(9.00)	
Bachelors and Masters	11(33.30)	4(12.10)	5(15.10)	5(15.10)	2(6.00)	
Unknown	1(3.00)	5(15.10)	1(3.00)	2(6.00)	0(0)	
Income status (frequency and percentage of frequency)						
<5 million tomans	8(24.20)	2(6.00)	3(9.00)	5(15.10)	3(9.00)	0.10^
Between 5 and 10 million tomans	11(33.30)	10(30.30)	11(33.30)	7(21.20)	14(42.20)	
>10 million tomans	13(39.30)	19(57.50)	17(51.50)	7(21.20)	15(45.40)	
Unknown	1(3.00)	2(6.00)	2(6.00)	14(42.20)	3(9.00)	
Previous history of breast cancer in family members (frequency and frequency percentage)						
yes	2(6.00)	2(6.00)	1(3.00)	1(3.00)	3(9.00)	0.747^
No	31(93.90)	30(90.90)	30(90.90)	31(93.90)	30(90.90)	
Unknown	0(0)	1(3.00)	2(6.00)	1(3.00)	0(0)	
Receiving education about BSE in the past (frequency and frequency percentage)						
yes	15(45.40)	9(27.20)	8(2.00)	7(21.20)	7(17.00)	0.273^
No	18(54.50)	22(66.60)	22(75.50)	24(72.70)	26(82.90)	
Unknown	0(0)	2(6.00)	2(4.40)	2(6.00)	0(0)	

* One-way Anova

^ Chi square

Table 2. Comparison of the Mean Levels in Problem solving, group learning, educational video, role playing pre- and post-intervention.

variable	Mean (standard deviation)				
	Control N=33	**role playing N=33**	**Educational video N=33**	**cooperative learning N=33**	**Problem solving N=33**
Preintervention	-2.97(4.90)	-6.12(5.61)	-6.70(3.48)	-3.39(3.43)	-5.36(4.48)
post intervention	-5.55(4.62)	-0.85(4.39)	-1.76(4.24)	-1.09(4.93)	-1.03(5.73)
Paired t-test value	2.59	4.22	1.58	5.24	3.24
P-value	**>0.05**	**<0.001**	**0.012**	**<0.001**	**<0.05**
Preintervention	-41.93(9.37)	-44.67(10.36)	-47.48(9.27)	-45.45(7.27)	-44.61(9.9)
postintervention	-43.55(7.19)	-46.81(4.55)	-47.18(8.83)	-46.12(3.05)	-44.01(5.91)
Paired t-test value	0.37	0.83	0.98	1.90	0.13
P-value	**0.71**	**0.40**	**0.33**	**0.06**	**0.89**
Practice					
Preintervention	2.45(2.68)	-1.39(2.67)	1.52(3.04)	1.45(2.36)	2.73(2.39)
postintervention	2.30(2.88)	-2.36(3.13)	3.03(1.72)	2.64(1.69)	3.09(2.18)
Paired t test value	1.05	0.56	3.10	2.65	3.00
P-value	**0.29**	**0.57**	**<0.05**	**<0.05**	**<0.05**

Table 3. The analysis of ANOVA on knowledge, attitude, and practice on breast self-examination pre- and post-intervention in groups.

		Sum of Squares	df	Mean Square	F	Sig(pvalue)	Effect size
Knowledge (posttest)	Between Groups	782.764	4	195.691	8.462	.000	0.175
	Within Groups	3700.182	160	23.126			
	Total	4482.945	164				
Attitude(posttest)	Between Groups	360.206	4	90.051	2.307	.060	0.055
	Within Groups	6206.836	159	39.037			
	Total	6567.042	163				
Practice(posttest)	Between Groups	17.673	4	4.418	.770	.546	0.019

	Within Groups	917.939	160	5.737			
	Total	935.612	164				
Knowledge(pretest)	Between Groups	360.667	4	90.167	0.760	.550	0.017
	Within Groups	3180.970	160	19.881			
	Total	3541.636	164				
Attitude(pretest)	Between Groups	524.891	4	131.223	1.516	.200	0.037
	Within Groups	13848.810	160	86.555			
	Total	14373.700	164				
Practice(pretest)	Between Groups	52.606	4	13.152	1.887	.115	0.045
	Within Groups	1115.030	160	6.969			
	Total	1167.636	164				

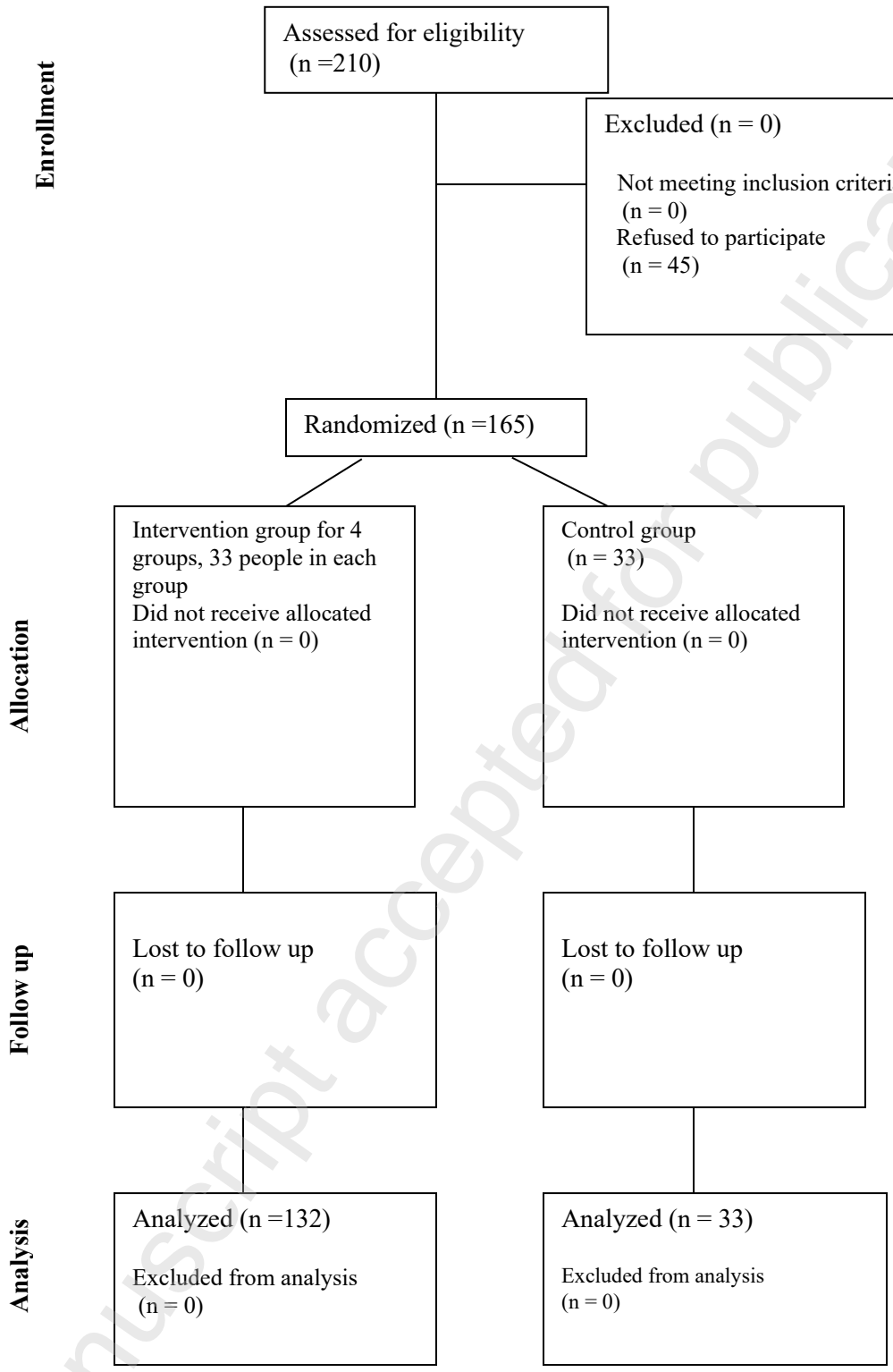

Figure 1. The CONSORT diagram for the study.