Group Investigation Method Improves Breast Self-Examination Behavior in Women of Childbearing Age

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Abstract

Breast cancer is one of the most common cancers among women worldwide, with a high incidence rate. Breast self-examination (BSE) is considered to be one of the most effective methods because it is something that women can do on their own, without spending money, and it is convenient to do. Lack of information is the main reason why women do not perform BSE, so efforts are needed to increase the knowledge of BSE among women of childbearing age using the cooperative learning method. This study aims to determine the effectiveness of the group learning method on BSE behaviour in women of childbearing age. Quasi-experimental pretest-posttest design with control group. The treatment group of women of childbearing age received health education on BSE using the group investigation method, while the control group received the jigsaw method. The population in this study was all women of childbearing age in the working area of Bengkulu City Health Centre with a sample of 52 people using Proportional Stratified Random Sampling technique. The independent variable was group examination method and the dependent variable was knowledge, attitude and behaviour to do early detection of breast cancer with BSE. The external variables were information exposure and health worker support. Data were analysed univariate, bivariate with Wilcoxon and Mann-Whitney and multivariate with Spearman rank. Results showed that the group study method influenced knowledge p<0.00, attitude p<0.00, behaviour p<0.00. The jigsaw method influences knowledge p<0.001, attitude p<0.00, behaviour p<0.00. The jigsaw method is the dominant factor influencing knowledge of BSE among women of childbearing age. Health care providers should provide health education about BSE to women of childbearing age using the cooperative learning methods of group investigation and jigsaw puzzle, as an effort to control breast cancer through early detection.

Keywords : Behavior, BSE, group investigation

INTRODUCTION

Cancer is one of the non-communicable diseases (NCDs) that constitute a global health burden; it is a disease characterised by the presence of abnormal cells that can develop uncontrollably and have the ability to invade and move between cells and tissues of the body and is a major cause of death. Indonesia is also a country that contributes to the epidemiological transition and the double burden of public health problems due to increasing cancer disease (Kemenkes, 2019).

Data from Riskesdas in 2013 and 2018 showed an increase in cancer prevalence in Indonesia from 1.4‰ to 1.49‰. The highest prevalence in Gorontalo regency was 2.44‰, while in Bengkulu regency it was 1.4‰. The prevalence of cancer was higher in the female group than in the male group. This is because female-specific cancers such as breast cancer and cervical cancer are the most commonly reported cancers in Indonesia (Kemenkes, 2019).

Breast cancer is one of the most common types of cancer suffered by women throughout

the world with a high incidence rate. In 2019, the global death rate for women from breast cancer reached 41,760 (American Cancer Society, 2019). In 2020, the incidence of women suffering from breast cancer in Indonesia based on Global Cancer Observatory data reached 68,858 (16.6%) cases out of a total of 396,914 new cases of all types of cancer, with the number of deaths reaching more than 22 thousand (WHO, 2020). This data confirms that the most common cancer cases in Indonesia are breast cancer (Globocan, 2020).

The 2018 Riskesdas results showed that the prevalence of tumours/cancers in Indonesia increased from 1.4 per 1000 population in 2013 to 1.79 per 1000 population in 2018. The highest incidence rate for women was breast cancer at 42.1 per 100,000 population, with an average mortality rate of 17 per 100,000 population (Kemenkes, 2021). In Bengkulu Province, the total number of cancer patients who underwent empowerment at M Yunus Regional General Hospital Bengkulu was 77 cases, with 44 cases of breast cancer. Data from the Bengkulu City Health Office in 20222 found that the most data on women of childbearing age who have lumps around their breasts are in the working area of the Anggut Atas Health Center, namely 25 (9.3%) women have tumors or lumps around their breasts, the Beringin Raya Maintenance Health Center recorded tumors or lumps in 14 women (8.1%) and the padang serai health center 10 women (1.4%).

The increasing number of new cases that appear each year will be a threat because when breast cancer has grown to a size that can be felt, the most common physical sign is a painless lump, it is therefore expected that early detection of breast cancer can play an important role in reducing the incidence of breast cancer to a more advanced stage. this will indirectly reduce the mortality rate in breast cancer patients (Kusumawaty et al., 2021).

Breast Cancer Detection through BSE is expected to be one of the efficient ways because women can do it independently without spending money and practical to do it. It can also increase awareness and alertness if there is a lump or abnormal condition in the breast. If abnormal conditions in the breast can be detected early, then it can help a woman get treatment as soon as possible before the cancer becomes an advanced stage. To increase public awareness and knowledge of the importance of early detection of breast cancer, efforts such as education are needed (Kemenkes, 2019).

Data shows that the number of women in the reproductive age group of 30-50 years who have breast cancer screening in Indonesia is only 7.34%, with the highest coverage in Bangka Belitung province at 25.42% and the lowest in Papua province at 0.91. In Bengkulu province, the coverage of breast cancer screening is only 6.80% (Kemenkes, 2019). A previous study found that only 55.5% of women of childbearing age had poor knowledge about BSE and only

27.1% practised BSE, and 93% of them had poor BSE practices. Ethnic factors, individual and family history, and poor knowledge are factors influencing BSE practice among women of childbearing age (Assfa Mossa, 2022; Myint et al., 2020).

Previous research has also shown that lack of information is the main factor in women of childbearing age not being screened for BSE (B. K. & Kaphle, 2023; Mihret et al., 2021). There is therefore an urgent need to increase the knowledge of women of childbearing age about BSE in order to prevent and detect breast cancer as early as possible, before it progresses to an advanced stage (B. K. & Kaphle, 2023). The process of providing information to make it interesting and easy to understand must be more innovative, health education or education provided will be more innovative if it uses several methods that can make students more active in participating in every learning process, one of which is the cooperative learning method type Group Investigation. Based on research by Sunarti & Hadi, (2019), it is stated that the Group Investigation cooperative learning model is a learning method that makes students motivated and more actively interact with each other in groups and involves participation between members in a small group to interact with each other.

METHODS

The design of this study was a quasi-experimental pretest-postest design with a control group. The treatment group consisted of women of childbearing age who received health education about BSE using the Group Investigation Method, while the control group received education using the Jigsaw Method. This research was carried out in June-August 2023. The population in this study were all women of reproductive age in the working area of Bengkulu City Health Centre. The sampling process in this study used the proportional stratified random sampling technique, a total of 52 people with the inclusion criteria of age 30-50 years, never had a mammography examination, not diagnosed with cancer or breast tumour. The independent variable was group examination method and the dependent variable was knowledge, attitude and behaviour to do early detection of breast cancer with BSE. The external variables were information exposure and support from health workers.

The jigsaw method is carried out with stages 1) The researcher determines the topic which is about breast cancer and BSE 2) Then the researcher makes a learning design together by dividing each sub-topic and the role of each respondent, the respondent completes the given topic with learning resources from researchers or from outside in the form of internet 3) Respondents presented the material, discussed, demonstrated how to do BSE, asked questions and answers and each respondent tried to practice BSE. The intervention stage was carried out

in two sessions, session 1 was in the form of presentation of material using lecture method, question and answer, discussion, in session 2 BSE practice was carried out. (Sunarti & Hadi, 2019; Widyanto, 2017).

In the control group, the jigsaw method was used with the following stages: 1) Researchers divide the respondents into 5 groups of stages 2) Researchers divide each topic related to breast cancer material and BSE in each group 3) The group discusses the provided material, then presents it in their group 4) After that, group members (expert team) move to explain each other to other group members, including conducting BSE demonstrations according to the assigned material 5) The researcher as a facilitator summarises the material and re-explains, concluding with the method of lecture, question and answer and demonstration activities (Z. Lubis & Nopriani, 2023)

In the intervention, whether in the treatment or control group, the researcher acted as a facilitator. Research instruments included leaflets and modules, questionnaires to measure knowledge and attitudes, and a checklist to assess respondents' ability to practice BSE. Knowledge was measured before the intervention, 2 weeks after the intervention and 1 month after the intervention. Data were analysed univariately, bivariately with Wilcoxon and multivariately with Spearman rank. This study received ethical approval from the Health Research Ethics Committee of Poltekkes Kemenkes Bengkulu No.KEPK.BKL/409/06/2023.

RESULTS

The results of the normality test using Kolmosgrov Smirnov on the variables of knowledge, attitude and behaviour in both the group study and jigsaw groups showed that all variables had a p-value <0.05, which means that the data are not normally distributed, so for bivariate tests using Wilcoxon and Mann Whitney.

Table 1. Mean of education with Group Investigation method on BSE Behavior

Group Investigation	N	Min	Max	Mean	Median	SD
Knowledge						
Before (Pretest)	52	3	9	6,15	6,00	1,461
After (Postest 1)	52	6	10	7,81	8,00	0,895
After (Postest 2)	52	9	10	9,81	10,00	0,402
Attitude						
Before (Pretest)	52	25	37	29,38	28,00	3,138
After (Postest 1)	52	27	37	31,88	31,50	2,551
After (Postest 2)	52	37	40	38,27	38,00	0,827
Action						
Before (Pretest)	52	18	25	22,12	22,00	1,633
After (Postest 1)	52	19	28	23,19	23,00	2,136
After (Postest 2)	52	27	30	27,77	27,50	0,951

**Wilcoxon test*

Table 2. Mean of education with Jigsaw method on BSE Behavior

Jigsaw	N	Min	Max	Mean	Median	SD
Knowledge						
Before (Pretest)	52	2	9	5,50	5,00	1,944
After (Postest 1)	52	5	10	6,96	7,00	1,661
After (Postest 2)	52	7	10	8,85	9,00	1,047
Attitude						
Before (Pretest)	52	25	34	28,81	28,00	2,245
After (Postest 1)	52	27	36	29,73	29,50	2,164
After (Postest 2)	52	35	40	36,92	37,00	1,383
Action						
Before (Pretest)	52	18	24	21,00	21,00	1,549
After (Postest 1)	52	19	28	24,04	25,00	2,615
After (Postest 2)	52	25	30	26,50	26,00	1,421

**Wilcoxon test*

The results of the univariate analysis can be seen in Table 1, where the 26 respondents who received training using the group investigation method, while the mean value of posttest 1 knowledge was 7.81, then for the average postest 2 knowledge of women of childbearing age given the group investigation method is 9.81, this shows that there is an increase in the average value of knowledge from pretest and postest 1 by 1.66 And the average increase from postest 1 and postest 2 is 2, while the increase from pretest to postest 2 is 3.66.

The table above also shows that of the 26 respondents who were given education with the group investigation method, the average pretest attitude value was 29.38, while the average posttest 1 attitude value was 31.88, then for the average posttest 2 attitude of women of childbearing age given the group investigation method was 38.27, this shows that there is an increase in the average attitude value from pretest and postest 1 by 2.5 and an increase in the average attitude from posttest 1 and postest 2 by 6.39, while the increase from pretest to postest 2 is 8.89.

The table above also shows that of the 26 respondents who were given education with the group investigation method, the average value of the pretest action was 22.12, while the average value of the post-test 1 action was 23. then for the average posttest 2 action women of childbearing age given the group investigation method is 27.77. this shows that there is an increase in the average value of action from pretest and postest 1 by 1.07 And the average increase from postest 1 and postest 2 is 4.58, while the increase in action from pretest to postest 2 is 5.65.

The table above also shows that of the 26 respondents who were given education with the jigsaw method, the average pretest value of knowledge was 5.50, while the average value of posttest 1 knowledge was 6. then for the average postest 2 knowledge of women of childbearing

age given the jigsaw method is 8.85, this shows that there is an increase in the average value of knowledge from pretest and postest 1 by 1.46 and an increase in the average from postest 1 and postest 2 by 1.89, while the increase from pretest to postest 2 is 3.35.

The table above also shows that of the 26 respondents who were given education with the jigsaw method, the average pretest attitude value was 28.81, while the average posttest 1 attitude value was 29.73, then for the average posttest 2 attitudes of women of childbearing age given the jigsaw method was 36,92, this shows that there is an increase in the average value of attitude from pretest and postest 1 by 0.92 And the average increase from posttest 1 and postest 2 is 7.19 while the increase in attitude from pretest to postest 2 is 8.11.

The results of the univariate analysis can be seen in Table 2, where the 26 respondents who were given education with the jigsaw method, the average value of the pretest action was 21.00, while the average value of the postest 1 action was 24.04, then for the average posttest 2 action women of childbearing age given the jigsaw method is 26.50, this shows that there is an increase in the average value of action from pretest and postest 1 by 3.04 and an increase in the average from postest 1 and postest 2 by 2.46 while the increasein action from pretest to postest 2 is 5.5.

Table 3. Effect of education with Group Investigation method on BSE Behavior

Variable	n	Min	Max	Mean	Median	SD	Mean difference	P value
Group Investigation								
Knowledge								
Before	26	3	9	6,15	6,00	1,461	2,658	0,001
After	26	9	10	8,808	9,000	0,4489		
Attitude								
Before	26	25	37	29,38	28,00	3,138	5,697	0,001
After	26	37	40	35,077	35,000	1,3762		
Behavior								
Before	26	18	25	22,12	22,00	1,633	3,361	0,001
After	26	27	30	25,481	25,500	1,3075		
Jigsaw								
Knowledge								
Before	26	2	9	5,50	5,00	1,944	2,404	0,001
After	26	7	10	7,904	7,500	1,1749		
Attitude								
Before	26	25	34	28,81	28,00	2,245	4,517	0,001
After	26	35	40	33,327	33,000	1,3110		
Behavior								
Before	26	18	24	21,00	21,00	1,549	4,269	0,001
After	26	25	30	25,269	25,500	1,4982		

**Wilcoxon test*

The results of statistical tests showed that there was an effect of the group investigation method on the knowledge of BSE among women of childbearing age with a value of p<0.001. The

results of statistical tests showed that there was an effect of the Group Investigation method on the knowledge of BSE among women of childbearing age. Table 1 also shows that the mean score of attitude before the intervention was 29.38, after education with the method it increased to 35.07 with a mean difference of 5.69. The results of statistical tests show that there is an effect of the Group Investigation method on the positive attitude of women of childbearing age towards BSE with a value of p<0.001. Table 1 also shows that the mean score of behaviour before the intervention was 22, after education with the method it increased to 25.50 with a mean difference of 3.36. Statistical test results show that there is an effect of the Group Investigation method on the behaviour of women of childbearing age towards BSE with a value of p<0.001.

Table 3 shows that the mean score of knowledge before the intervention was 6.15, after training with the method it increased to 8.808 with a mean difference of 2.40. The statistical test results show that there is an effect of the jigsaw method on the knowledge of women of childbearing age about BSE with a value of p<0.001. Table 1 also shows that the mean score of attitude before the intervention was 28.81, after training with the method it increased to 33.32 with a mean difference of 4.51. Statistical test results show that there is an effect of the jigsaw method on the positive attitude of women of childbearing age towards BSE with a value of p<0.001. Table 1 also shows that the mean score of behaviour before the intervention was 21, after training with the method it increased to 25.26 with a mean difference of 4.26. Statistical test results show that there is an effect of the jigsaw method on the behaviour of women of childbearing age about BSE p<0.001.

Table 4. Effectiveness Of Group Investigation And Jigsaw Methods On Knowledge, Attitude And Behaviour Towards BSE Among Women Of Childbearing Age

Variabel	n	Min-Max	Mean	SD	Mean Difference	p-*value*
Knowledge						
Investigation	52	9-10	8,808	0,4489	0,904	0,001
Jigsaw		7-10	7,904	1,1749		
Attitude						
Investigation	52	37-40	35,077	1,3762	1,75	0,001
Jigsaw		35-40	33,327	1,3110		
Behavior						
Investigation	52	27-30	25,481	1,3075	0,212	0,590
Jigsaw		25-30	25,269	1,4982		

**mann whitney test*

Table 4 shows bivariate results with a man whitney test to see the effectiveness of both methods against knowledge, attitudes and behavior of BSE in women of childbearing age. The result can be seen that the ratio of knowledge scores after intervention in the investigation group method group is 8.80, whereas in the jigsaw group 7.90 with an average difference of 0.90 p value <0.001. This means that group investigation methods are more effective in

improving knowledge of BSE in fertile-age women than jigsaw methods.

Table 4 shows that the ratio of behavioral scores after intervention in the investigative group method group is 25.48, whereas in the jigsaw group 25.26 with an average difference of 0.21 p value <0.001. This means there is no difference in effectiveness between group investigation methods with Jigsaw against BSE behavior in women of childbearing age.

Table 5. Influence of Group Investigation, Jigsaw, Information Display and Health Support Methods on Knowledge, Speech and Behavior of BSE in childbearing age Women

Variable	Knowledge		Attitude		Behavior	
	Correlation Coefficient	**p value**	***Correlation Coefficient***	**p value**	***Correlation Coefficient***	**p value**
Group Investigation	0,066	0,747	0,185	0,366	0,036	0,861
Jigsaw	0,439	0,025	0,053	0,799	0,268	0,185
Information exposure	0,055	0,698	0,068	0,633	0,181	0,200
Health Worker Support	0,124	0,382	0,178	0,206	0,070	0,620

**spearman rank*

The statistical test results of table 4 indicate that the jigsaw method is the most dominant factor influencing knowledge about BSE in women of childbearing age with a p value of 0.02, a correlation coefficient of 0.43. This means that 43.9% of knowledge on BSE is influenced by the Jigsaw technique, the rest by other factors. Table 4 also shows that there are no more dominant factors affecting the attitude and behavior of BSE among women of reproductive age, the group investigation method, the jiksaw, the information exposure and health support are variables that influence knowledge, attitudes and behaviour about the BSE of women of fertile age.

DISCUSSION

The study found that there was an influence of education using group investigation methods on knowledge about BSE in women of childbearing age. This result is in line with previous research that education has been shown to improve women's knowledge about BSE in the fertile age. There are significant differences between the knowledge score of women in the reproductive age about breast cancer symptoms, risk factors, treatment, prevention, screening of breast cancer and BSE (Sarker et al., 2022). Pada penelitian ini edukasi tentang BSE menggunakan metode group investigasi, ini terbukti dapat meningkatkan pengetahuan Wanita usia subur.

The same results were also obtained from previous studies that group investigation methods with segmented stages were believed to improve audience knowledge of the subject of the language being discussed. The phase of the group investigation method includes 1) the division of group and sub-themes performed by participants; 2) the participants choose to plan tasks in advance by dividing tasks to each group member; 3) the participants investigate the given problem by analyzing the answers of other group members; 4) the participants collect the entire group member's answers and will present them according to the agreement made at the beginning of learning; 5) the student's presentation; 6) the participants understand learning when asking and listening to answers delivered at the time of presentation and afterwards (Widyaningsih & Puspasari, 2020). It is a learning method that requires the active participation of the participants of the discussion thus improving the understanding of the substance of the submitted material. Group Learning Model Investigation improves the participants' ability to think critically so that they understand the material better (Wicaksono et al., 2017).

The study also found that education using group investigation methods also improved the positive attitude of women of childbearing age to BSE. It supported the finding that there were positive changes about BSE in women of reproductive age who had received health education. Fertile-age women in the population who do not receive access to information, have low knowledge before intervention, have better post-educational awareness, so community-based intervention on BSE should be applied to fertile-aged women both in rural and urban areas. It supports previous findings that positive perceptions and attitudes increase after given BSE education with a $p<0.00$, therefore development and training is required for health workers who provide education and health promotion (Khiyali et al., 2017).

The results of this study also found that educational group methods of investigation can improve the behavior of women of fertile age in BSE practice, this is in line with previous findings that there is a correlation between the level of knowledge and behaviour BSE $p=0.02$, Women who have high knowledge are times more likely to have BSE than women who have low awareness. Therefore, interventions to improve BSE behavior in women should be directed at increasing women's knowledge and awareness of the importance of BSE (Putri et al., 2023).

In this study, the group investigation method is believed to be a good attempt to enhance knowledge of women of fertile age thus provoking interest and motivation to change behavior in BSE examinations. It supports the finding that to improve good learning outcomes, different learning approaches are needed. Group investigation methods can enhance creativity and problem-solving abilities, thereby enhancing positive behavior in specific areas (Kleebbua & Siriparp, 2016; Safitri et al., 2024). The results of research conducted by Subudi showed that

there was an increase in learning activities and outcomes in students who applied the group investigation method, the average classical score of learning activities was 14.8 with an active category, and the average classical score of learning outcomes was 81.7 with a good category. So it can be concluded that the application of the GI model increases students' biology learning activities and results (Ketut Subudi, 2021).

The results of this study also found that education using the Jigsaw method also affects knowledge, BSE attitudes in women of childbearing age. It shows that a variety of learning methods can enhance understanding, attitudes and positive behavior according to learning goals (Darling-Hammond et al., 2020). Jigsaw learning module is a cooperative learning model that is able to create a pleasant learning atmosphere, students can develop their own learning style so as to increase motivation in following learning (Ayu P.P. et al., 2021).

Similar research results also found that the Jigsaw method effectively improves student learning outcomes, besides that the jigsaw technique has advantages among others can increase the interest and participation of students actively to follow learning good influence in improving the interest, activity and learning outcome of students, so that students become more comfortable and enjoy their role in the classroom (Hafid et al., 2017). The results of this study found that the Jigsaw method also influenced BSE behavior in women of childbearing age. This result supports previous findings that the jigsaw learning model is a participant-centred active learning model, it trains participants to be responsible for the material and teach each other, thereby improving student learning outcomes. Participants are easier to absorb the material delivered and collaborate well in their group, so the Jigsaw approach is the best participatory learning method to enhance the participant's learning outcome (Ayu P.P. et al., 2021; Indra et al., 2024). In the cooperative learning model of the jigsaw type, there are groups of origin and groups of experts. A group of students with different abilities, genders, and family backgrounds, a group of experts, or groups of students from different groups, is assigned to study the subject to be explained to the members of the group. A group is a combination of several experts from the group of origin. The key to success in a jigsaw is interdependence, i.e. each student depends, the condition increases the motivation of the student in learning so that improves the learning outcome becomes better (N. A. Lubis & Harahap, 2016).

The results of this study found that the group investigation method was more effective in improving the knowledge and attitude of women of fertile age about BSE. Similar results also found that group investigations methods were more effective for increasing the learning motivation of participants, therefore the application of the group examination method could be chosen as a cooperative learning method (Setiawati & Sahono, 2022). The results of a

multivariate analysis with spearman rank in this study found that the group investigation method, the Jigsaw method, health support information exposure is not the most dominant factor affecting the attitude and behavior of BSE in women of childbearing age, but the method is the only most dominating factor influencing the knowledge of women of age about BSE. Health education on BSE should use a variety of approaches. This effort is aimed at raising the awareness of women of childbearing age to conduct early detection of possible breast cancer. The findings show that 89% of fertile-age wamitas are aware of breast cancer, but only 26% know about consciousness. Only 18% of women have their breasts checked, but only 5% have BSE on a regular basis (Kumarasamy et al., 2017).

Health education can influence women to identify breast abnormalities through increased awareness and practice of BSE. Training by health professionals can enhance knowledge, sensitivity and vulnerability, seriousness and perceived benefits. Educational interventions on BSE in an efficient, flexible, varied way, using varied and interesting methods can increase women's knowledge and awareness of BSE compared to the control group (Husna et al., 2021). Educational interventions on BSE have been shown to have a significant influence on the knowledge and practice of BSE, positive lifestyle changes, physical activity, vegetable consumption so they need to be applied to individuals as an integral part of breast cancer control. Health education based on the theory of health belief models that cover vulnerabilities, severity, benefits, barriers and self-effectiveness can be applied to encourage BSE behavior on a regular basis (Masso-Calderón et al., 2018; Pirzadeh et al., 2021).

CONCLUSIONS

There is an influence of the group investigation method on the knowledge, attitude and behavior of BSE. There is the effect of the jigsaw method on BSE's knowledge, behaviour and attitude. Jigsaw is the most dominant variable affecting BSE knowledge in women of childbearing age. It is suggested that healthcare providers should provide health education about BSE by applying cooperative learning methods of group investigation and jigsaw in women of childbearing age as an attempt to control breast cancer through early detection.

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