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Effect Of Cold Compress Administration On Nausea Index In Breast Cancer Patients After Chemotherapy

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ABSTRACT

Breast cancer is a type of malignant tumor that originates from breast cells, as a result of uncontrolled cell growth, so that it forms abnormal tissue and spreads to surrounding tissues or other organs. The purpose of this study was to determine the effect of cold compresses on the nausea index in breast cancer patients after chemotherapy. This study uses a quasi-experiment with a pretest and posttest control group design with purposive sampling techniques, data collection using questionnaires with interview techniques. The 52 samples were divided into 26 intervention groups and 26 control groups that were given cold compresses 2 hours after chemotherapy, using an ice bag with a temperature of 10-16°C given 1x for one day of treatment for 15 minutes. The results showed that the majority of respondents aged 51-60 years (42.3%) had a high school education (32.7%), worked as a housewife (53.8%), suffered from breast cancer for 1 year (28.8%) and underwent the 3rd cycle of chemotherapy (19.2%). The rate of nausea after giving cold compresses in the intervention group was in the mild pain category (73.1%). The level of nausea after being given cold compresses in the control group was in the category of moderate nausea (57.7%). The results of the Mann Whitney Test in the treatment group showed that p value = 0.000 could be concluded to have an effect, while the control group showed p value = 0.083 it could be concluded that there was no significant effect of cold compresses on nausea.

Keywords: Breast Cancer, Cold Compress, Nausea, Post-Chemotherapy

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INTRODUCTION

According to WHO (2021), the incidence of breast cancer is 19.3 million cases. The World Health Organization (WHO) stated that in 2022 there were 20 million women diagnosed with breast cancer and 9.7 cases of cancer deaths worldwide per year. Then according to WHO (2023), the incidence of breast cancer in 2023 is more than 2.3 million cases. Data from the Global Cancer Observatory (GLOBOCAN), breast cancer is the disease with the largest number of sufferers suffered by many women after cervical cancer with a prevalence of 66,271 cases (16.2%) with a mortality rate of 22,598 people (9.3%). Without intervention, cancer prevalence is expected to increase by 63% between 2025 (WHO, 2022).

Based on data from Riskesdas Basic Health Research in 2018, the prevalence of cancer in Indonesia increased by 1.79%, compared to the prevalence in 2013 with a figure of 1.4%. This prevalence shows that 5 of the 34 most cases are in Bali Province at 2.27% (Riskesdas, 2018). Based on data from the Ministry of Health of the Republic of Indonesia, the recapitulation of early detection of breast cancer in Indonesia in 2023 is 14.52% (4,284,861 out of 41,881,534 among women aged 30-50 years). From the results of the recapitulation, it shows that Bali is one of the regions with a case coverage of 6.23% that still needs to be followed up (Kemenkes RI, 2023).

The Bali Provincial Health Office in 2023 recorded the number of new cases of cancer patients based on age group in the female gender group at 17,192 patients (Dinas Kesehatan Provinsi Bali, 2024). Based on data from the 2023 Denpasar City Health Office Profile, from 9,778 women aged 30 to 50 years who carried out cervical cancer detection and breast examination, results were found to be 0.96% IVA positive, 0.08% tumors or lumps, and 0.01% suspected cancer. A total of 5 people (55.6%) diagnosed with tumors and breast cancer were referred (Dinas Kesehatan Kota Denpasar, 2023). One of the health service centers in Bali is Bali Mandara Hospital which provides Integrated Cancer Services, so this hospital is one of the referral centers for cancer patients.

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Based on the results of the preliminary study, data obtained from Bali Mandara Hospital is that in 2022 the number of breast cancer cases is 68 cases, and the number of breast cancer cases undergoing chemotherapy is 22 cases. In 2023, the number of breast cancer cases is 242 cases, while breast cancer patients undergoing chemotherapy are 224 cases, then breast cancer cases in 2024 will increase to 306 cases and chemotherapy patients will decrease by 387 cases.

Cancer is a disease condition characterized by the transformation of normal cells into abnormal cells that cannot be controlled, multiply uncontrollably, and attack the surrounding tissues so that they reach further organs of the body. Breast cancer is the most feared type of cancer by women after cervical cancer, called breast cancer when cells in the breast grow uncontrollably and can spread to nearby tissues to distant organs of the body. Symptoms include lumps in the breasts, changes in the shape of the breasts, the appearance of wrinkles on the skin around the breasts, discharge from the breast nipples, and redness of the skin (Setiawati et al., 2019).

To reduce the possibility of serious complications, it is necessary to take preventive measures through certain therapies. Some types of therapy that can be used as a guideline in preventing the spread of cancer cells include surgery, radiation and chemotherapy. Treatment given to cancer patients is adjusted to the type and stage of cancer experienced by the patient (Tukan, et al., 2024). Chemotherapy is given to patients who are already in the advanced stages, in accordance with the guidelines issued by the National Committee for Cancer Control (KPKN) in 2015 in the Cancer Clinical Service Guidelines (Komite Nasional Penanggulangan Kanker, 2015).

Chemotherapy is a group of drugs that affect the cell division cycle, which is used to treat malignancies or malignant tumors. Chemotherapy has been shown to be effective in destroying cancer cells, but it can also attack healthy cells, especially active cells that divide rapidly Khairani (2019). Damage to healthy cells can lead to a decrease in the number of blood cells (such as erythrocytes, leukocytes, and platelets) and damage cells in the mouth, digestive organs and reproductive system.

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As a result, this condition can cause side effects in the form of gastrointestinal symptoms, such as nausea and vomiting (American Cancer Society, 2020).

Nausea and vomiting due to Chemotherapy-induced nausea and vomiting (CINV) caused by the stimulation of chemotherapy drugs and the results of their metabolites against the center of nausea and vomiting, that is Vomiting center (VC) which is found in the area of the medulla ablongata (the end of the brainstem and cerebellum). VC receives cholinergic stimuli and histamine that cause vomiting in reaction to pain and vestibular disorders. VC also receive stimulus from Chemoreceptor Trigger Zone (CTZ) or the postrema area, which responds in part to endogenous toxins and chemical stimuli such as chemotherapy or medications. Some types of drugs that can cause nausea and vomiting while undergoing chemotherapy include high-dose and moderate drugs that cause nausea and vomiting (Gupta et al., 2021).

If nausea and vomiting are not treated appropriately and promptly, the condition can make the patient weak, as it is related to decreased appetite, deteriorated nutritional status, dehydration, and electrolyte imbalance, this can negatively impact the quality of life in cancer patients (Dadkhah et al., 2019).

Results of the research shows that about 40%-70% of patients experience nausea and vomiting during chemotherapy, even though they have been given high doses (Aybar, 2020). According to research in University Of Rochester Medical Cancer It was found that delayed nausea results occurred in 50-80% of patients most often associated with chemotherapy treatment regimens such as the drugs dxorubicin and cisplatin (Ryan, 2010). The prevalence of nausea and vomiting due to chemotherapy in 2021 reached 90% in patients receiving chemotherapy with high emetogenic (HEC) and between 30% and between 30% and 90% in patients receiving chemotherapy with moderate emetogenic (Harahap, 2022). The results of the research conducted in Tambelang Semarang, It found that of the 90 patients who underwent chemotherapy, 75 patients (83.3%) experienced nausea and 71 patients (78.9%) experienced vomiting due to chemotherapy (Hamdani &

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Anggorowati, 2022). According to NCI, about 29% of patients who undergo chemotherapy experience anticipatory nausea (ANV), and about 11% of patients experience anticipatory vomiting (ANV) (National Cancer Institute, 2023). Research conducted in RSPAL Dr. Ramelan Surabaya showed that, based on the chemotherapy regimen undergone by the patient, the most common side effect after chemotherapy was nausea, with a percentage of 52.48%. Nausea and vomiting are side effects that can appear within 1 to 24 hours after chemotherapy (Tukan, 2024).

Efforts to reduce nausea in chemotherapy patients can be done by administering antiemetic drugs, although these drugs can cause side effects such as drowsiness, dry mouth, indigestion, and constipation. Therefore, to help reduce the side effects of antiemetic use, other alternative treatments such as non-pharmacological treatment or complementary therapy are needed. Non-pharmacological methods are cost-effective, easy to learn and also have minimal side effects (Ervina & Ayubi, 2018). In addition, non-pharmacological approaches may play a role in reducing the frequency and dose of antiemetic drugs given to patients when used concomitantly with pharmacological treatment (Peoples et al., 2019). One of the non-pharmacological treatment methods that can alleviate the symptoms of nausea and vomiting in chemotherapy patients is to give cold compress therapy.

Cold compresses are one of the non-pharmacological methods that can be applied to relieve symptoms of nausea, including nausea that often occurs after chemotherapy. Cold compresses can be done by attaching cold compresses to the abdominal area because cold temperatures can affect the nervous system and muscles in the abdominal area, cold compresses can reduce the spread of nerve signals that cause nausea and vomiting. The way cold compresses work is by inhibiting the activity of enterochromapin (EC) cells, which are cells that produce serotonin receptors (5-HT) in the intestine, which will cause a nausea-vomiting reflex. By inhibiting the activity of cold compressed enterochromafin cells, it can reduce the production of serotine, so that nausea and vomiting can be reduced.

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Based on research conducted about "Managing Postoperative Nausea With an Application of Ice Pack to the Posterior Upper Neck" showed that of the 70 patients included in the study, 61% reported that the use of ice packs was effective in relieving nausea, 14% were unsure, and 24% reported that ice packs were ineffective (Sharfenberg et al., 2022).

Based on the results of research conducted by Indah Yuniarti entitled "The Effect of Cold Water on the Incidence of Vomiting After Chemotherapy for Cervical Cancer Chemotherapy in Room 9 of Oncology of Dr. Saiful Anwar Malang Hospital" The results of the study showed that there was an effect of cold water on the incidence of vomiting after chemotherapy chemotherapy for cervical cancer with results (P-value 0.006 < 0.05) (Yuniarti, 2019).

Based on previous efforts, from several article databases and journals such as Garuda Portal, Google Scholar, and PubMed, the author has not found a study that discusses the administration of cold compresses for post-chemotherapy nausea at Bali Mandara Hospital, Denpasar Bali. So based on the results and description of the research above, I as a researcher am interested in researching further related to "Effect of Cold Compress Therapy on Nausea Index in Post-Chemotherapy Breast Cancer Patients at Bali Mandara Regional General Hospital in 2025".

METHOD

This study employed a quantitative approach with a pseudo-experimental (quasy-experiment) design using a pretest and posttest control grup. The independent variable in this study is cold compresses, the dependent variable in this study is the nausea index in breast cancer patients after chemotherapy. The population in this study is breast cancer patients after chemotherapy with inclusion criteria, including patients aged 30-70 years, breast cancer patients undergoing chemotherapy, breast cancer patients who experience nausea after chemotherapy, patients who have a history of nausea due to previous chemotherapy, patients who are willing to be given intervention and cooperative, while the exclusion criteria are patients who are not willing to sign informed consent when data collection, breast cancer patients who stop in the middle of

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activities for some reason, breast cancer patients who experience hypothermia, patients who experience emesis gravidarum or morning sickness during pregnancy, and patients who have a history of motion sickness emesis induced. The sampling techniques used are non-probability sampling with techniques purposive sampling.

This study used a questionnaire as the research instrument Rhodes Index Nausea Vomiting and Retching. With a total of 8 statements of which 3 questions were to measure nausea (no. 4,5.7), and 5 questions to measure vomiting (no 1.2.3.6.8) with scale likert 0-4. The questionnaire has been conducted by Hilman Syarif, faculty of nursing, University of Indonesia Depok conducted by two hospitals in Jakarta with a sample of 30 respondents. Data collection was carried out for 2 weeks, from 07 to 25 April 2025. The administration of cold compress therapy to reduce nausea in post-chemotherapy patients, using media ice bag, given 2 hours after chemotherapy with a single dose for one day of treatment, duration 15 minutes. With the observation of nausea and vomiting using the Rhodes INVR questionnaire with interview techniques was carried out 2 times to measure the level of nausea at the time before the administration of cold compresses and 5 minutes after the administration of cold compresses.

Univariate analysis will be presented in the form of a frequency distribution table, which includes age data. Bivariate analysis aims to determine the effect of cold compress administration on the nausea index in post-chemotherapy breast cancer patients by ordinal scale test using non-parametric statistical tests uji Mann Whitney Test.

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RESULTS

The distribution of the frequency of respondent characteristics by age at Bali Mandara Hospital in 2025 can be seen in the table 1.

Table 1. Frequency Distribution of Research Respondent Characteristics by Age at Bali Mandara Hospital in 2025

No.	Variable	Frequency	Percentage
.	Early adulthood (30-40)	7	**13,5**
.	Late Adulthood (41-50)	15	**28,8**
.	Early Elderly (51-60)	22	**42,3**
.	Late elderly (61-70)	8	**15,4**
	Total	52	**100**

Table 1 It showed that of the 52 respondents in the study, the characteristics of respondents based on the age of most of the study subjects were 51-60 years old, namely 22 respondents (42.3%).

The results of the analysis of the research subjects based on variables can be seen in tables 2 and 3

Table2. Frequency Distribution of Nausea Index Respondents before and After Intervention Given Cold Compresses at Bali Mandara Hospital in 2025

Result	Light		Keep		Heavy		Severe	
	Frekuensi (n)	Persentase (%)	Frekuensi (n)	Persentase (%)	Frekuensi (n)	Persentase (%)	Frekuensi (n)	Persentase (%)
Pre-test	6	23,1	12	46,2	7	26,9	1	3,8
Post-test	19	73,1	7	26,9	0	0	0	0
Total								26

Table 2 shows that from the results of the intervention group's research, before being given a cold compress using an ice bag, most of the respondents experienced moderate nausea, namely 12 respondents (46.2%). Meanwhile, after being given a cold compress using an ice bag, most of the respondents felt mild nausea, namely 19 respondents (73.1%).

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Table 3. Distribution of Frequency of Pretest and Posttest Nausea Index Respondents in the Control Group at Bali Mandara Hospital in 2025

Result	Light		Keep		Heavy		Severe	
	Frekuensi (n)	Persentase (%)	Frekuensi (n)	Persentase (%)	Frekuensi (n)	Persentase (%)	Frekuensi (n)	Persentase (%)
Pre-test	9	34,6	16	61,5	1	3,8	0	0
Post-test	11	42,3	15	57,7	0	0	0	0
Total								26

Table 3 shows that from the results of the control group's research, the pretest results of most of the respondents experienced moderate nausea, namely as many as 16 respondents (61.5%). Meanwhile, the results of the posttest most of the respondents felt moderate nausea, namely as many as 15 respondents (57.7%).

The results of data analysis on the effect of cold compress administration on the nausea index in breast cancer patients after chemotherapy at Bali Mandara Hospital in 2025 can be seen in the table 4.

Table 4. Data Analysis of the Effect of Cold Compress on Nausea Index in Post-Chemotherapy Breast Cancer Patients at Bali Hospital in 2025

	Group	N	Mean Rank	Z	Sig
Pretest-Posttest	Eksperimen	26	34,08	-3,939	0,000
	Eksperimen	26	18,92		
Pretest-Posttest	Control	26	27,79	-0,717	0,473
	sControl	26	25,21		

Table 4 showed that the results of the pre-test and post-test of the experimental group were obtained from the Mann Whitney test, Based on the results of the Mann Whitney test, the Asymp.Sig value was 0.000 ($p < 0.05$). Therefore, data show that there is a significant effect of cold compresses on nausea in breast cancer patients after chemotherapy before and after in the experimental group. Meanwhile, from the pre- test and post-test of the control group, the Mann Whitney test was obtained, which was Asymp.Sig value of 0.473 ($p > 0.05$) therefore the data showed no significant effect of cold compresses on nausea in post-chemotherapy breast cancer

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VOLUME 3, No 1. Tahun 2025 , ISSN 3032-4408 (Online)
https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs

patients before and after in the control group.

DISCUSSION

Table 1 It showed that of the 52 respondents in the study, the characteristics of respondents based on the age of most of the study subjects were 51-60 years old, namely 22 respondents (42.3%). The results of this study are in line with the research conducted with a total of 62 respondents, with the title of the study "The Effect of Eucalyptus Aromatherapy on Nausea and Vomiting in Breast Cancer Patients After Chemotherapy" which stated that the majority of respondents in this study were early elderly (51-60) years old with a total of 26 respondents (41.9%) (Indriyani et al., 2023).

The results of this study are not in line with the research conducted by (Sijabat et al., 2024), with a total of 76 respondents consisting of 36 intervention and control groups, with the title "Lemon Aromatherapy Against the Intensity of Nausea and Vomiting in Cancer After Chemotherapy" in this study showed that the majority were aged 56-65 years with the number in the intervention group of 21 respondents (58.3%) and the control group of 20 respondents (55.6%).

Old age is a stage of life characterized by changes in digestive function and the body's response to substances that enter the body. Age factors are also related to the appearance of side effects in patients undergoing chemotherapy. Over the age of < 60 years are at risk of nausea and vomiting, both in the acute and delayed phases. Although age does not directly affect nausea and vomiting, the condition is affected by the discomfort and content of drugs used in chemotherapy so that it triggers nausea and vomiting. In a study conducted by (Juartika, 2019) 24 It was stated that there was no direct relationship between age and the incidence of nausea and vomiting, but age contributed to the onset of nausea and vomiting.

Table 2 shows that from the results of the intervention group's research, before being given a cold compress using an ice bag, most of the respondents experienced moderate nausea, namely 12 respondents (46.2%). Meanwhile, after being given a cold compress using an ice bag, most of the respondents felt mild nausea, namely 19 respondents (73.1%).

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This research is in line with research conducted by (Melina, 2020), dengan The number of 20 respondents with the title "The Effect of Fennel Aromatherapy and Instrumental Music Therapy on the Response of Nausea and Vomiting in Post- Chemotherapy Patients at DR Hospital. Moewardi Sukarta" showed that 80% of women with breast cancer before being given fannel aromatherapy and instrumental music therapy experienced moderate levels of nausea and in research conducted by (Intan Pertiwi et al., 2025), with the title "The Effect of Peppermint & PMR Aromatherapy to Reduce Nausea and Vomiting in Breast Cancer Chemotherapy Patients" with a total of 36 respondents after being given an intervention showed that as many as 18 respondents (100%) experienced a level of nausea in the mild category. The results of this study are not in line with the research conducted by (Intan Pertiwi et al., 2025), regarding "The Effect of Peppermint & PMR Aromatherapy to Reduce Nausea and Vomiting in Breast Cancer Chemotherapy Patients" with a total of 36 respondents showed that as many as 14 respondents (77.78%) before being given the intervention experienced a level of nausea in the mild category and the results of research conducted by (Indriyani et al., 2023), regarding "The Effect of Eucalyptus Aromatherapy on Nausea and Vomiting in Post-Chemotherapy Breast Cancer Patients" with a total of 62 respondents as most of the respondents after being given the intervention experienced a moderate level of nausea in the category as many as 28 respondents (45.2%).

Table 3 shows that from the results of the control group's research, the pretest results of most of the respondents experienced moderate nausea, namely as many as 16 respondents (61.5%). Meanwhile, the results of the posttest most of the respondents felt moderate nausea, namely as many as 15 respondents (57.7%).

This research is in line with the research conducted (Melina, 2020), with a total of 20 respondents with the title "The Effect of Fennel Aromatherapy and Instrumental Music Therapy on the Response of Nausea and Vomiting in Post-Chemotherapy Patients at DR Hospital. Moewardi Sukarta" pretest results showed that 17 respondents (85.0%) women with

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VOLUME 3, No 1. Tahun 2025 , ISSN 3032-4408 (Online)
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breast cancer experienced moderate levels of nausea while the posttest results were in line with research conducted by (Melina, 2020), with a total of 20 respondents with the title "The Effect of Fennel Aromatherapy and Instrumental Music Therapy on the Response of Nausea and Vomiting in Post-Chemotherapy Patients at DR Hospital. Moewardi Sukarta" showed that 19 respondents (95%) experienced a moderate level of nausea.

The results of this study are not in line with the research conducted by (Intan Pertiwi et al., 2025), with the title "The Effect of Peppermint & PMR Aromatherapy to Reduce Nausea and Vomiting in Breast Cancer Chemotherapy Patients" with a total of 36 respondents showed that the pre-test results of 17 respondents (94.4%) experienced a level of nausea in the mild category and the results of this study are not in line with the research conducted by (Pujisantoso, 2019), with the title "The Effect of Progressive Muscle Relaxation Exercises on the Reduction of Nausea and Vomiting Complaints in Cancer Patients with Chemotherapy at Dr. Saiful Anwar Hospital Malang" with a total of 18 respondents, showed that 13 respondents (72.2%) experienced a level of nausea with a mild category in the post-test of progressive muscle relaxation exercises.

Table 4 showed that the results of the pre-test and post-test of the experimental group were obtained from the Mann Whitney test, Based on the results of the Mann Whitney test, the Asymp.Sig value was 0.000 ($p < 0.05$). Therefore, data show that there is a significant effect of cold compresses on nausea in breast cancer patients after chemotherapy before and after in the experimental group. Meanwhile, from the pre- test and post-test of the control group, the Mann Whitney test was obtained, which was Asymp.Sig value of 0.473 ($p > 0.05$) therefore the data showed no significant effect of cold compresses on nausea in post-chemotherapy breast cancer patients before and after in the control group.

The results of this study are in line with the research conducted by (Melina, 2020), with the title "The Effect of Fennel Aromatherapy and Instrumental Music Therapy on the Response of Nausea and Vomiting in Post-Chemotherapy Patients at DR Hospital. Moewardi Sukarta" with a research sample of 40 respondents, with 20

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VOLUME 3, No 1. Tahun 2025 , ISSN 3032-4408 (Online)
https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs

control group respondents and 20 intervention group respondents. This study is quasi- experimental with a pre-posttest with control group approach, with the sampling technique used being purposive sampling. Data analysis was carried out a normality test with normal data values using a paired sample t test, and if the data was abnormal, a non-parametric difference test was carried out using the Wilcoxon test.

The results of this study showed that before fennel aromatherapy and instrumental music therapy were given, the intervention group experienced moderate nausea with a total of 16 respondents (80%) and after fennel aromatherapy experienced moderate nausea with a total of 10 respondents (50%). After being given fennel aromatherapy and instrumental music therapy, a paired sample t test was obtained, the result was p value = 0.000 ($p < 0.05$), then it can be concluded that there is an effect of fannel aromatherapy and instrumental music therapy on the response of nausea and vomiting in patients after chemotherapy in the intervention group.

The results of this study showed that before fennel aromatherapy and instrumental music therapy were given in the control group experienced moderate nausea with a total of 17 respondents (85%) and after being given fennel aromatherapy experienced moderate nausea with a total of 19 respondents (95%). After being given fennel aromatherapy and instrumental music therapy, the wilcoxon test was obtained with a p value = 0.739 ($p < 0.05$), it can be concluded that there was no significant effect of fannel aromatherapy and instrumental music therapy on the response of nausea and vomiting in patients after chemotherapy in the control group.

According to Lee's theory (2018), nausea and vomiting are the most common side effects and unpleasant things for patients after undergoing chemotherapy treatment. The incidence of nausea and vomiting due to chemotherapy side effects is 70-80%. This symptom can reduce the patient's ability to carry out daily activities, even causing patients to only be able to lie in bed and not be able to meet their basic needs in activities. Therefore, to help reduce the side effects of antiemetic use, other alternative treatments such as non-pharmacological treatment or

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complementary therapy are needed. Non-pharmacological methods are cost-effective, easy to learn and also have minimal side effects 18. In addition, non-pharmacological approaches may play a role in reducing the frequency and dose of antiemetic drugs given to patients when used concomitantly with pharmacological treatment 19. One of the non-pharmacological treatment methods that can alleviate the symptoms of nausea and vomiting in chemotherapy patients

is to provide cold compress therapy, complementary therapy and other non-pharmacological therapies.

CONCLUSION(S)

Based on the age characteristics of the respondents, most of the respondents were 51-60 years old with a total of 22 respondents (42.3%). The results of the patient's nausea rate before cold compress using ice bags in the intervention group were in the category of moderate nausea, namely 12 respondents and the level of nausea in patients after being given cold compresses using ice bags decreased in the category of mild nausea as many as 19 respondents. The results of the pre-test of the patient's nausea level in the control group were in the category of moderate nausea, namely 16 respondents and the results of the post-test of the level of nausea in patients were in the category of moderate nausea as many as 15 respondents. The results of this study prove that there is an effect of cold compresses on the level of nausea in breast cancer patients after chemotherapy at Bali Mandara Hospital in the intervention group using the Mann Whitney test, it was found that the p-value was 0.000. Meanwhile, in the control group, there was no significant effect of cold compresses on the level of nausea in breast cancer patients after chemotherapy at Bali Mandara Hospital in the control group using the Mann Whitney Test p-value of 0.473.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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VOLUME 3, No 1. Tahun 2025 , ISSN 3032-4408 (Online)
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