

Combination Essential Ginger Oil and Acupresure Relaxation Techniques to Cancer Patients Post Chemotherapy

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The intervention of the aroma of ginger essential oil and relaxation techniques of meridian PC6 acupresure could reduce nausea, vomiting, increase comfort and decrease anorexia, but the research have not been found to prove effectiveness if these two interventions are combined. The purpose of the research was to explain the effect of the combinations of aroma of ginger essential oil and relaxation techniques of acupuncture meridian PC6 on nausea vomiting, comfort and anorexia. Quantitative with research design Quasy Experiment with pre-post test control group design (four groups pretest-postest). This research, the population of cancer patients post chemotherapy who experienced nausea and vomiting. The sampling method used by non probability consecutive sampling, consisted of 30 respondents for each group according to inclusion criteria. The research variables were essential ginger oil aroma, relaxation technique acupresure meridian PC6, nausea vomiting, comfort, anorexia. The instruments used were nausea and vomiting questionnaire, anorexia questionnaire and shortened general comport questionnaire (GCQ) and analyzed using MANOVA. There were a decrease in nausea and vomiting $p=0,000$, an increase in comfort $p=0,000$, a decrease in anorexia $p=0,000$ before and after the intervention of a combination of ginger essential oil and relaxation technique acupresure PC6 meridian. The combination of essential ginger aroma and relaxation techniques for acupresure meridian PC6 were one of the alternative interventions that was effective in reducing nausea and vomiting, increasing comfort, decreasing anorexia in cancer patients.

Key words: *Acupresure, Anorexia, Comfort, Chemotherapy, Ginger, Nausea Vomiting.*

Introduction

Chemotutan Induced Nausea and Vomiting (CINV) is a term used to describe the incidence of nausea and vomiting in post-chemotherapy patients (Rapoport *et al.*, 2015). Nausea, vomiting is a condition caused by a strong contraction of the abdominal muscles, causing stomach contents to be pushed out through the mouth (Herrell, 2014). Nausea, vomiting can also cause disorders of the immune system, impaired cognitive function, social problems, unable to fulfill social responsibility, disruption of physical activity and comfort (Navari and Aapro, 2016; Fejzo *et al.*, 2019). Nausea, vomiting in post-chemotherapy patients is a common symptom that can be debilitating and can cause delays in giving chemotherapy as well as dehydration, electrolyte imbalance, weight loss, anorexia (Gan *et al.*, 2014). Anorexia is a loss of appetite that is often experienced by patients with cancer but is often ignored (Mattox, 2017; Van Norren, Dwarkasing and Witkamp, 2017). In advanced cancer, anorexia is the fourth most common symptom after nausea, vomiting, pain, and fatigue (Tai *et al.*, 2016; Goto *et al.*, 2017).

According to Globocan data, International Agency for Research on Cancer (IARC) that in 2012 cancer caused about 8.2 million deaths, there were 14,067,894 new cases of cancer and 8,201,575 deaths from cancer worldwide. The biggest causes of cancer deaths each year are due to lung, liver, stomach, colorectal and breast cancer (International Agency for Research on Cancer. World Health Organization., 2014; Release, 2018). The number of cancer sufferers is expected to increase every year and is estimated to reach 23.6 million new cases per year in 2030 (Indonesian Ministry of Health, 2016).

Non-pharmacological therapy is a nurse's independent nursing action for patients who receive chemotherapy is to provide comfort to patients by reducing or eliminating nausea and vomiting due to chemotherapy (Idris & Astarani, 2019). Complementary therapy can be used as supportive therapy for cancer patients undergoing chemotherapy. One of the herbs that can be used is ginger, ginger has been shown to be effective in increasing comfort, controlling emotions, reducing nausea, vomiting, anorexia, motion sickness, seasickness, post surgery, and pregnancy (Jazizadeh and Jung, 2018). Acupressure relaxation techniques are also one method that can focus on feeling relaxed because it can reduce stretching and relaxation in

the muscles, with acupressure on the PC6 point meridians can eliminate nausea and vomiting (Răban-Motounu and Vitalia, 2014). This study aims to analyze the effect of the combination of essential ginger oil and acupressure relaxation techniques meridianpoint pc6 to nausea vomiting, comfort, anorexia of cancer patients post chemotherapy.

Literature Review

Chemotherapy

Chemotherapy is a way of treating tumors by eradicating cancer cells (called cytostatics) that are drunk or infused into blood vessels. So, chemotherapy drugs spread throughout the body's tissues, can eradicate cancer cells that have spread widely throughout the body. Because of the wide spread of chemotherapy drugs, the broad killing power, side effects are usually more severe than the two previous treatment modalities. Chemotherapy drugs are commonly called sitostatics, which have the effect of inhibiting or killing all cells that are actively dividing. The working principle of treatment with chemotherapy is to poison or kill cancer cells, control the growth of cancer cells, and stop their growth from spreading, or to reduce the symptoms caused by cancer. Chemotherapy is sometimes the first choice for dealing with cancer. Chemotherapy is systemic, in contrast to radiation or surgery that is local, so chemotherapy can reach cancer cells that may have spread and spread to other parts of the body (Goto *et al.*, 2017; American Cancer Society, 2020).

The use of chemotherapy is different for each patient, sometimes as the main treatment, in other cases done before or after surgery or radiation. The success rate of chemotherapy also varies depending on the type of cancer. Two or more drugs are often used as a combination. The reason for doing combination therapy is to use drugs that work on different parts of the cell's metabolic process, thus increasing the likelihood of the number of cancer cells being destroyed. In addition, the harmful side effects of chemotherapy can be reduced if drugs with different toxic effects are combined, each in a lower dose than the required dose if the drug is used alone (Castro *et al.*, 2016; Schooley *et al.*, 2017).

Uncontrolled nausea and vomiting can affect therapy in the patient as a whole and affect the response of therapy and reduce the cure rate of cancer patients. In addition, uncontrolled nausea and vomiting can also cause dehydration, electrolyte imbalance, weight loss, and

malnutrition. Prolonged vomiting can cause esophageal, gastric damage and bleeding (Herrell, 2014). Nausea and vomiting are early manifestations that are often found from the toxicity of chemotherapy drugs. The etiology of nausea and vomiting of many different problems, therefore the limitation is also different, can be simple or can be complex (Navari and Aapro, 2016; Mattox, 2017). Controlling nausea and vomiting is needed as an important consideration in cancer treatment and supportive therapy (Gan *et al.*, 2014; Fejzo *et al.*, 2019).

Comfort

Convenience is defined as a prosperous condition and is the end of the nursing action taken to the client. Comfort is a basic value of nursing goals at all times. Comfort is a necessity in the range of pain to health and comfort is the final stage of the nurse's therapeutic action towards the patient. The comfort theory approach developed by Kolcaba offers comfort as the forefront of the nursing process. Kolcaba considers that holistic comfort is a total comfort covering physical, psychospiritual, environmental and psychosocial comfort. Comfort level is divided into three namely relief where the patient needs specific comfort needs, ease which is free from discomfort or increase comfort, transcendence is able to tolerate or adapt to discomfort (Freedman and Freedman, 2015; van Dijk *et al.*, 2018).

In the perspective of Kolcaba Holistic Comfort's view is defined as an immediate experience that becomes a force through needs that will reduce the relief, ease, and transcendence that can be fulfilled in four contexts of experience which include physical, psychospiritual, social and environmental aspects. Other assumptions developed by Kolcaba that comfort is a concept that has a strong relationship with nursing. Nurses provide comfort for patients and their families through interventions with a comfort measurement orientation. Acts of consolation by nurses greatly strengthen patients and families who can feel like they are in their own homes. The condition of the family and the patient is strengthened by the actions of the health service performed by the nurse by involving behavior (Krinsky, Murillo and Johnson, 2014; Bergström *et al.*, 2018).

Essential Ginger Oil

Aromatherapy is a way of treating the body or healing diseases by using essential oils (Marx et al., 2017). Essential oils are the main raw material for the benefit of aromatherapy preparations (Lua, Salihah, & Mazlan, 2015). Aromatherapy is the use of essential oils aimed at handling the mind, body and spirit (Marx et al., 2017). Aromatherapy is the use of essential oils obtained from aromatic plants for therapeutic properties (Lua et al., 2015). Clinical aromatherapy is recognized as part of holistic nursing by the American Holistic Nurses Association and by most state nursing boards.

Aromatherapy has a positive effect because it is known that fresh and fragrant aromas stimulate sensory, receptor and ultimately affect other organs so that it can have a powerful effect on emotions. The aroma is captured by the receptors in the nose which then provide further information towards the brain that controls emotions and memory as well as providing information to the hypothalamus which is a regulator of the body's internal systems including the sexuality system, body temperature, and reactions to stress. *Zingiber officinalis* can ward off nausea and gastrointestinal discomfort. Ginger rhizomes contain essential bioactive compounds (gingerols) primary bioactive agents in non-volatile and stinging components. Ginger is an effective herbal remedy for nausea and vomiting and does not cause side effects. Antiemetic activity in ginger can be caused by gingerols and shogaols, both of which are phenolic compounds. The content of 5-Hydroxytryptamine₃ receptor antagonists in ginger which is also anti-metic and has odors that can reduce emotions (Danel and Puła, 2019).

Acupressure

Acupressure is an intervention that has been proven effective in improving the quality of life of patients with cancer. Acupoint acupressure that is often used is the Shenmen point (HT-7). Yongquan (K11), Neiguan (PC6), Tian-Zhu, Ju-Que, and Bai-Hui (Deye, N., (2016). Pericardium point PC6 or Nei Guan is derived from the words Nei means medial and Guan which means to pass through. The PC6 point is the location of the forearm, the PC6 point stimulation is carried out with the palm facing upward, the PC6 point is 5 cm from the distal wrist crease PC6 point is the point located on the meridian path. heart membrane which has two branches namely the heart membrane and heart, then penetrates the diaphragm in the

middle space and below the stomach, these meridians also cross the stomach and intestine (Idris & Astarani, 2019).

Acupressure therapy for nausea and vomiting can be done by pressing the forearm manually on PC6 in the wrist area of 3 fingers from the distal area between two tendons (flexor carpi radialis and palmaris longus muscle) for 30 seconds to 2 minutes acupressure can work quickly usually two up to 3 minutes in indigestion (PJ Hesketh et al., 2015). The stimulatory effect at this point can increase beta-endorphin release in the pituitary and ACTH along the Chemoreceptor Trigger Zone (CTZ) inhibiting the vomiting center (Poulsen et al., 2008). Acupressure aims to balance the body's energy so that optimal body conditions are achieved, optimal body organs can function properly. Acupressure is done to stimulate the acupressure point with a massage that is strong enough or a comfortable massage, dw time required is 30 seconds, and ordered in the direction of the meridian flow. While acupressure with the aim of depression (analgesia) is done a strong massage or massage that hurts the time required is 40 seconds, and sorted in the opposite direction of the meridian flow. The effects of analgesic massage can be identified through pain due to massage that gradually decreases and disappears (McKeon, Smith, Hardy, & Chang, 2013).

Methodology

This research is a quantitative study with a Quasy Experiment research design and pre-post test control group design research design. In this study the intervention group was given a combination treatment of ginger essential oil aroma and PC6 meridian point acupressure relaxation techniques for nausea, vomiting, comfort, anorexia. Whereas the control group consisted of 3 groups namely the group that was given essential oil, the group who were given acupressure relaxation points for the PC6 meridian point and the group that was given the intervention according to hospital standards. The target population in this study is cancer patients in Makassar. Affordable population in this study were post-chemotherapy cancer patients. The research sample of 30 patients for each group with inclusion criteria as follows: Clients are experiencing nausea and vomiting after chemotherapy, Cancer stage II and III, Clients aged ≥ 21 years and over, Getting drugs for chemotherapy in the form of FAC (5-Fluorourasil, Doxorubicin, Cyclophosphamide), Clients who do adjuvant and neoadjuvant chemotherapy, Clients who have done ≥ 2 times of chemotherapy.

Clients who have done chemotherapy can describe how nausea vomiting after chemotherapy, Clients who like the smell of ginger before the intervention first ask the client whether the client likes the smell of ginger and do not have a history of ginger allergy, have a good olfactory smell (Nervus olfaktoris) can be seen in the assessment physically in the patient's status that the smell system is normal by using one of the tests (odor stix, smelling, 12-inch alcohol test and scratch and sniff card), the patient is conscious, can be oriented to people, place and time (can communicate verbally). Sample selection with consecutive sampling. The independent variable in this study was the combination of the aroma of ginger essential oil and PC6 acupressure meridian point relaxation technique. The dependent variable in this study was nausea, vomiting, comfort, anorexia in cancer patients after chemotherapy.

The aroma of ginger essential oil (EO) contains essential oil (gingerol) simplicia ingredients purchased at Materia Medika Batu Malang. Then distilled the Pharmacy section of Airlangga University to become EO, the aroma of this essential oil uses an aromatherapy diffuser and acupressure relaxation techniques using the hands to stimulate / massage the patient's four forearms from the distal at the PC6 meridian points according to the Standart Operational Procedure (SOP). Instrument for variable nausea, vomiting and anorexia using questionnaires and observation sheets created by researchers. The comfort questionnaire sheet comes from the Kathy Colkaba Web comfort line used by researchers at California State University San Marcos. This questionnaire sheet is used to measure holistic changes in patient comfort levels using the Shortened General Comfort Questionnaire (GCQ) that has been modified by the researcher. Researchers have tested the validity of the Hospital Dr. Wahidin Sudirohusodo General Hospital as many as 30 respondents. This study has passed the ethical review conducted by the Ethics Commission of the Faculty of Nursing, Airlangga University, with the number 1275-KEPK dated 30 January 2019.

Results and Findings

Below are complaints of nausea, vomiting, comfort and anorexia in the ginger essential oil combination group and PC6 meridian point acupressure relaxation techniques, ginger essential oil group, PC6 meridian point acupressure relaxation group and the standard group.

Table 1. Distribution of nausea, vomiting, comfort, anorexia before intervention

Independent Variable	Combination		Essensial oil jahe		Acupressure PC6		Standard	
	f	%	f	%	f	%	f	%
Nausea and Vomiting								
Mild	4	13,3	2	6,7	2	6,7	9	30,0
Moderate	20	66,7	13	43,3	16	53,3	10	33,3
Severe	4	13,3	8	26,7	9	30,0	9	30,0
Very Severe	2	6,7	7	23,3	3	10,0	2	6,7
Comfort								
Comfort	-	-	-	-	-	-	-	-
Discomfort	30	100	30	100	30	100	30	100
Anorexia								
Anorexia	26	86,7	23	76,7	24	80,0	25	83,3
Do not Anorexia	4	13,3	7	23,3	6	20,0	5	16,7

From the table above it can be seen that each group has the same discomfort score that is 100 percent has a score of 30 (uncomfortable), complaints of nausea and vomiting each group has almost the same distribution for mild, moderate, severe and severe vomiting while for anorexia complaints from all four groups had anorexia complaints.

Table 2. Distribution of nausea, vomiting, comfort, anorexia after the intervention

Independent Variable	Combination		Essensial oil jahe		Acupressure PC6		Standard	
	f	%	f	%	f	%	f	%
Nausea and Vomiting								
Mild	28	93,3	23	76,7	25	83,3	3	10,0
Moderate	2	6,7	7	23,3	5	16,7	9	30,0
Severe	-	-	-	-	-	-	12	40,0
Very Severe	-	-	-	-	-	-	6	20,0
Comfort								
Comfort	28	93,3	22	73,3	22	73,3	3	10,0
Discomfort	2	6,7	8	26,7	8	26,7	27	90,0
Anorexia								
Anorexia	4	13,3	11	36,7	11	36,7	22	73,3
Do not Anorexia	26	86,7	19	63,3	19	63,3	8	26,7

From the table above it can be seen that the mildest nausea and vomiting complaints are 28 respondents (93.3%), highest comfort 28 respondents (93.3%) and no anorexia of 26 respondents (86.7%) in the ginger essential oil combination group and PC6 acupressure. To see the effect of the combined intervention of the aroma combination of ginger essential oil and PC6 meridian point acupressure relaxation techniques for nausea, vomiting, comfort, anorexia in cancer patients after chemotherapy, a multivariate manova test was performed. The results of the manova test show that the box's test value is 28,144 with $p = 0.083$ which means that the homogeneity of the variance and the homogeneity test of the variance and covariance matrices are the same. Wilks Lambda test results obtained $p = 0,000$ which means

that in general there is a combination of the aroma effect of ginger essential oil and PC6 meridian point acupressure relaxation techniques to reduce nausea, vomiting, increased comfort, decreased anorexia in cancer patients after chemotherapy.

To see the difference in nausea, vomiting, comfort and anorexia can be seen in Table 3. Statistical test results Multiple Comparison Test variable nausea vomiting shows the combination treatment group of ginger essential oil aroma and PC6 meridian point acupressure relaxation techniques have the most significant effect on nausea vomiting $p = 0,000$, comfort $p = 0,000$ and anorexia $p = 0,000$.

Table 3 Effects of a combination of the aroma of ginger essential oil and PC6 meridian point acupressure relaxation techniques, aroma of ginger essential oil and PC6 acupressure relaxation techniques on nausea, vomiting, comfort and post test anorexia between treatment and control groups (n = 30)

<i>Dependent Variable</i>	(I) Group	(J) Group	Sig.	95% Confidence Interval		
				Lower Bound	Upper Bound	
Nausea and Vomiting	Combination	Control	0,000	-6,56	-5,57	
		<i>Esensiaoil</i>	0,000	-4,10	-3,10	
		acupressure PC6	0,000	-3,06	-2,07	
	acupressure PC6	Control	0,000	-4,00	-3,00	
		<i>Esensiaoil</i>	0,000	-1,53	-0,54	
		Combination	0,000	2,07	3,06	
	<i>esensial oil jahe</i>	Control	0,000	-2,467	2,96	
		acupressure PC6	0,000	0,54	4,00	
		Combination	0,000	3,10	6,56	
	Control	<i>Esensiaoil</i>	0,000	1,97	2,96	
		acupressure PC6	0,000	3,00	4,00	
		Combination	0,000	5,57	6,56	
	Comfort	Combination	Control	0,000	16,79	27,21
			<i>Esensiaoil</i>	0,000	12,12	22,55
			acupressure PC6	0,000	7,19	17,61
acupressure PC6		Control	0,000	4,39	14,81	
		<i>Esensiaoil</i>	0,063	-0,28	10,15	
		Combination	0,000	-17,61	-7,19	
Aroma <i>esensial oil jahe</i>		Control	0,079	-0,55	9,88	
		acupressure PC6	0,063	-10,15	0,28	
		Combination	0,000	-22,55	-12,12	
Control		<i>Esensiaoil</i>	0,79	-9,88	0,55	
		acupressure PC6	0,000	-14,81	-4,39	

<i>Dependent Variable</i>	(I) Group	(J) Group	Sig.	95% Confidence Interval	
				<i>Lower Bound</i>	<i>Upper Bound</i>
Anoreksia	Combination	Combination	0,000	-27,21	-16,79
		Control	0,000	0,34	0,80
		<i>Esensiaoil</i>	0,011	0,07	0,53
	acupresure PC6	acupresure PC6	0,390	-0,13	0,33
		Control	0,000	0,24	0,70
		<i>Esensiaoil</i>	0,087	-0,03	0,43
	Aroma <i>esensial oil</i> jahe	Combination	0,390	-0,33	0,13
		Control	0,023	0,04	0,50
		acupresure PC6	0,087	-0,43	0,03
	Control	Combination	0,011	-0,53	-0,07
		<i>Esensiaoil</i>	0,023	-0,50	-0,04
		acupresure PC6	0,000	-0,70	-0,24
		Combination	0,000	-0,80	-0,34

The results of this study indicate there is an effect of the combination of the aroma of ginger essential oil and PC6 meridian point acupresure relaxation techniques to reduce nausea, vomiting, increased comfort and decreased anorexia. The combined interventions of ginger essential oil aroma and PC6 meridian point acupresure relaxation techniques through different mechanisms. The results of this study are in line with the results of the study (Poulsen et al., 2008) which stated the essential or gingerol content found in the aroma of ginger essential oil can stimulate receptor (olfactory) receptors and then stimulate the limbic system to provide stimulus to the hypothalamus which is catalyzed into the neuroserotonin in the digestive organs, which can stimulate gastrointestinal receptors (olfactory). to suppress gastrointestinal muscles that cause anti-emetic effects so as to reduce nausea, vomiting, increase comfort, and stimulate the patient's appetite. Reduced anorexia in cancer patients after chemotherapy can accelerate the healing process (W. M. Marx et al., 2013).

Gingerol is the most active ingredient, has antagonistic activity on M3 cholinergic and serotonergic 5-HT₃ receptors and can speed up the time of emptying the stomach and can prevent nausea and vomiting (Giacosa et al., 2015). Ginger (*Zingiber officinale roscoe*) is a medicinal plant with many claimed therapeutic uses such as antifatulence, antiemetics, reviving gingivitis, expectorants and appetite stimulants. Phitochemical ginger consists of 6-gingerol, 8-gingerol, and 6-shogaol (Haniadka, Rajeev, Palatty, Arora, & Baliga, 2012). Even

though 6-gingerol is the most active compound, 6-gingerol is not competitively inhibiting the recombinant human activity and the original 5-HT₃ receptor of enteric neurons. In addition, gingeonal, especially 6-gingeonal, and 6-shogaol are markedly suppressed by central and peripheral dopamine, P substance, and NK-1 reseotor (Qian et al., 2010).

In this study the mean post-chemotherapy nausea and vomiting affect the female sex due to hormonal influences that contribute to sensivity. This is supported by the results of research Sholihah et al., (2016) women are more likely to experience nausea and vomiting influenced by the female hormone estrogen. The high frequency of female sex with nausea and vomiting after chemotherapy is due to hormonal influences that contribute to sensitivity to the incidence of nausea and vomiting after chemotherapy.

The intervention of the aroma of ginger essential oil can suppress the gastrointestinal system which has anti-emetic effect so that it can reduce nausea and increase comfort and reduce anorexia. This intervention is very simple, generally affordable, and inexpensive, in line with Konmun et al., (2017) research that gingerol contains antiemetics sources. This research is also supported by the research of Marx et al., (2017) that the content of gingerol which has antiemetic content, which can reduce CINV and improve appetite and quality of life of cancer patients who receive chemotherapy.

The patient felt nauseous, vomiting was reduced after the intervention of the aroma of ginger essential oil. The aroma of ginger essential oil is quite promising as an inexpensive noninvasive treatment for nausea, vomiting after chemotherapy. This study was supported by research by Ansari et al., (2016). Mild nausea and vomiting get ginger intervention for 15 minutes compared to those who did not get the intervention. The results of this study are also in line with the study of Lua et al., (2015) which states by using the aroma of ginger essential oil (gingerol) is an antiemetic that can increase appetite and reduce anorexia.

Acupressure interventions can be influenced by the patient's chemotherapy cycle, the higher the chemotherapy cycle the less nausea the patient vomits. This study was supported by Dibble et al., (2007) there was an effect of acupressure on nausea and vomiting due to chemotherapy in cancer patients, this study was conducted on respondents in the second and third cycles of chemotherapy. The limitation of this study is that it is only carried out on the



condition of a homogeneous chemotherapy cycle so that the results obtained are not influenced by the respondent's chemotherapy cycle, but the effect of the intervention given that the chemotherapy cycle basically affects to reduce nausea and vomiting due to chemotherapy.

The pericardium point PC6 or Nei Guan comes from the word Nei be medial and Guan which means to pass. PC6 point is the location in the forearm. The PC6 point stimulation is carried out in the palm-facing position. The PC6 point is at 5 cm distal from the pleated fold

Conclusions

The combination of ginger essential oil aroma and PC6 meridian point acupressure relaxation technique is more effective for decreasing nausea, vomiting, increased comfort, decreased anorexia in cancer patients after chemotherapy than the ginger essential oil aroma group, PC6 meridian point acupressure relaxation technique and control group. It can show that the combination intervention both of three intervention make the patient felt comfortable after chemotherapy treatment.

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