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Article

CAN ACUPRESSURE THERAPY REDUCE NAUSEA AND VOMITING IN CHEMOTHERAPY PATIENTS ? (A LITERATURE REVIEW)

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A B S T R A C T

Nausea and vomiting is the most common side effect in chemotherapy patients. To reduce nausea and vomiting, non-pharmacological therapy can be using. Acupressure is a treatment with emphasis on certain body points to relieve symptoms of the disease. The objective of this study is to determine the effectiveness of acupressure therapy on nausea and vomiting in chemotherapy patients. The design of this research is a literature review. Articles were created according to the PRISMA method, using the PubMed, ScienceDirect, and Sage databases. The research questions used the PICO method. The inclusion criteria for this review article were cancer patients undergoing chemotherapy, focusing on adult patients, articles with quasy experimental research or RCTs, and articles published from 2012-2022. The included articles were analyzed by JBI critical assessment. 7 articles were included in this study (5 RCT articles and 2 Quasy experiment articles). 6 articles showed that acupressure therapy had an effect on nausea and vomiting of chemotherapy patients while 1 article showed that there was no statistical significance of acupressure therapy on nausea and vomiting of chemotherapy patients. The conclusion is acupressure has been shown to reduce nausea and vomiting in chemotherapy patients.

I. INTRODUCTION

Cancer is a major world health problem that is quite serious, it is estimated that cancer cases continue to increase every year in almost every country (Siegel et al., 2022). In 2018 it was estimated that new cancer cases have reached 18.1 million and cancer deaths had reached 9.6 million cases (WHO, 2020). By 2020, Cancer was the leading cause of death worldwide with 10 million deaths (WHO, 2022).

One of the cancer treatments is chemotherapy. Unfortunately, this treatment is not only kills cancer cells but also healthy cells, causing side effects to the patient (Siegel et al., 2022). Nausea and vomiting are the most common side

effects of chemotherapy patients. Nausea and vomiting in chemotherapy patients is known as chemotherapy-induced nausea and vomiting (CINV). CINV is divided into 3 phases, namely: acute phase (appears within 24 hours after chemotherapy), delayed onset phase (3-5 days), and anticipatory phase (at an unexpected time) (Lavdaniti & Alexander, 2014). The burden of CINV is quite large, it can affect the patient's quality of life and affect daily activities (Yeo et al., 2021).

To reduce CINV, the doctor will prescribe antiemetic drugs according to the type of chemotherapy the patient is receiving (Siegel et al., 2022). However, antiemetic drugs can not completely eliminate nausea and vomiting during chemotherapy, therefore a proven non-pharmacological intervention is needed to reduce nausea and vomiting in patients as a complement to pharmacological therapy (Molassitosis, 2007).

Acupressure is a traditional Chinese medicine, where this therapy is done by placing emphasis on certain body points to relieve symptoms of the disease and provide relaxation (Smith et al., 2011). This non-pharmacological intervention was chosen because it is non-invasive and can reduce CINV (Peoples et al., 2019). The application of acupressure at the P6 point can effectively reduce nausea, vomiting, and anxiety in breast cancer patients (Genç & Tan, 2014). According to Avci et al (2016), acupressure therapy in chemotherapy patients is effective in reducing nausea and vomiting during chemotherapy. However, according to Molassiotis et al (2014) the use of acupressure was not statistically significant in reducing nausea and vomiting in chemotherapy patients. Therefore, it is necessary to conduct a literature review to summarize, evaluate, and describe the effectiveness of acupressure therapy in chemotherapy patients. The aim of this study was to evaluate the effectiveness of acupressure therapy on nausea and vomiting in chemotherapy (CINV) patients.

II. METHODS

This study is a literature review compiled using the PRISMA checklist guidelines (Moher et al., 2009). The literature search used 3 electronic databases: ScienceDirect, Sage and PubMed. Preparation of research question used PICO (Population, Intervention, Comparison, Outcomes). Population (P) is patient with chemotherapy / chemotherapy patient/ patient undergoing chemotherapy, intervention (i) is acupressure, comparison (C) is not applicable, and outcome (O) are nausea and vomiting. The inclusion criteria are (1) cancer patients undergoing chemotherapy, (2) focus on adult patients, (3) the design of research is quasy experimental or rct, and (4) articles published from 2012-2022 (Figure. 1). The research question is how is the effectiveness of acupressure therapy on nausea and vomiting in chemotherapy patients?

Identified 781 articles from the database used. Articles were screened by 1 person by excluding articles published before 2012, not research articles, not according to research questions, and not in accordance with inclusion criteria. The included articles were 7 articles. The 7 included articles were then extracted based on the author's name and year of publication, research design, method, sample size, intervention, instruments and findings. Critical appraisal was carried out by the researcher themselve using the JBI Checklist Randomized Control Trial for 5 RCT articles (Table. 1) and JBI Checklist Experimental Studies for 2 quasi experimental articles (Table. 2) (JBI, 2017).

III. RESULT

1. Description of studies

   A total of 781 articles were obtained from 3 databases. 407 articles were

excluded because they were not articles for the last 10 years, then 248 were excluded because they were not research articles. After reviewing them, 119 articles were excluded because they did not meet the inclusion criteria, and 7 articles were included in this study (Table 1). These articles were published from 2014-2022 with the sample size ranging from 48-500 chemotherapy patients. The samples in these articles vary across different types of cancer, while others study focus on only one type of cancer (such as breast and lung cancer). 5 articles are RCTs and 2 articles are quasy experiments. The study was conducted in the UK, Turkey, China, Iran and US (Table. 3).

2. Effect of interventions

Molassiotis et al (2014) revealed that there was no statistically significant difference between the P6 acupoint wristband acupressure group and the control group (p=0.23), the sham acupressure group and the control group (p=0.05), and the sham acupressure group and the control group (p=0,40). Therefore, neither of these pairwise comparisons was statistically significant. However, when viewed from the Mean Rhodes Index Nausea Experience of patients from cycles 1-4, the wristband acupressure therapy group had a stable decrease and less nausea experience than the control group.

Different from alexander's studies, Avci et al (2016) explained that an wristband acupressure that suppresses the P6 acupoint is effective for reducing nausea and vomiting in chemotherapy patients. In his study, it was found that there was a change in the mean episodes of nausea in all groups and was statistically significant ($p<0.05$). Although the number of vomiting episodes increased in the control and pressure groups, a steady decrease was observed in the acupressure ring group and this result was statistically significant ($p < 0.05$). Giving an wristband acupressure along with relaxation music was also shown to significantly reduce CIN when compared to the standard care group (p=0.02) (Peoples et al., 2019). Genç & Tan,'s research (2014) also states that the use of acupressure wristband can reduce the average score of nausea, vomiting, and vomiting and the average score of the patient's anxiety. Another study also showed that acupressure at points P6 and SP4 significantly reduced nausea ($p<.0001$) during the delayed phase compared to the control group (Shen & Yang, 2017). In addition to using an acupressure ring at point P6, auricular acupressure (points AH6a, TF4, CO12, CO4, and CO13) was also shown to reduce CINV (p=0.03) (Tan et al., 2022). Eghbali et al (2016) also revealed the same thing, namely Auricular Acupressure (AA) caused a decrease in the amount of CINV intensity in the acute phase and the group was significantly lower than the control group (p=0.001).

Table 1. JBI Critical Appraisal RCT

No.	Critical Appraisal Random Control Trial	Molassiotis et al (2014)	Avci et al (2016)	Tan et al (2022)	Eghbali et al (2016)	Peoples et al (2019)
1.	Was true randomization used for assignment of participants to treatment groups?	Yes	Yes	Yes	Yes	Yes
2.	Was allocation to treatment groups concealed?	Yes	Unclear	Yes	Yes	Yes
3.	Were treatment groups similar at the baseline?	Yes	Yes	Yes	Unclear	Yes
4.	Were participants blind to treatment assignment?	Unclear	Unclear	Yes	Unclear	Yes
5.	Were those delivering treatment blind to treatment assignment?	Unclear	Unclear	Yes	Unclear	Unclear
6.	Were outcomes assessors blind to treatment assignment?	Unclear	Unclear	Yes	Unclear	Unclear
7.	Were treatment groups treated identically other than the intervention of interest?	Yes	Yes	Yes	Yes	Yes
8.	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	Yes	Yes	Yes	Yes	Yes
9.	Were participants analyzed in the groups to which they were randomized?	Yes	Yes	Yes	Yes	Yes
10.	Were outcomes measured in the same way for treatment groups?	Yes	Yes	Yes	Yes	Yes
11.	Were outcomes measured in a reliable way?	Yes	Yes	Yes	Yes	Yes
12.	Was appropriate statistical analysis used?	Yes	Yes	Yes	Yes	Yes
13.	Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	Yes	Yes	Yes	Yes	Yes

Table 2. JBI Critical Appraisal Quasi-Experimental Studies

No.	Critical Appraisal Quasi-Experimental Studies	Genç & Tan (2014)	Shen & Yang (2017)
1.	Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	Yes	Yes
2.	Were the participants included in any comparisons similar?	Yes	Yes
3.	Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	Yes	Yes
4.	Was there a control group?	Yes	Yes
5.	Were there multiple measurements of the outcome both pre and post the intervention/exposure?	Yes	Yes
6.	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	Yes	Yes
7.	Were the outcomes of participants included in any comparisons measured in the same way?	Yes	Yes
8.	Were outcomes measured in a reliable way?	Yes	Yes
9.	Was appropriate statistical analysis used?	Yes	Yes

Table 3. Content Summary of Data findings

No.	Authors, Year, Country	Method	Sampling	Interventions	Instrument	Findings
1.	Molassiotis et al (2014) UK	RCT	500 patients undergoing chemotherapy were divided into 3 groups. 166 patients in the control group, 166 patients in the sham acupressure group, and 168 patients in the acupressure group.	• Patients in the acupressure group, in addition to receiving standard antitimetics, were given an acupressure wristbands. This bands were elastic with round plastic buttons protruding 1 cm. The P6 acupoint pressd by wristband. The patients were instructed to wear the wristbands from the morning (before chemotherapy) and for the next six days (7 days). • For the sham acupressure group, patients were instructed to use a band similar to the acupressure wristbands but the button is not at P6 acupoint. • All groups received standard antieimetics.	• The Rhodes Index of Nausea, Vomiting and Retching • MASCC Antiemesis Tool • Functional Assessment of Cancer Therapy-General • Hospital Anxiety and Depression Scale.	There was no statistically significant difference between three groups, although the degree of nausea in the proportion of patients taking acupressure wristbands and sham acupressure were somewhat lower than control group.
2	Avci et al (2016) Turkey	RCT	The sample in this study were patients with Myeloblastic Leukemia who underwent chemotherapy as many as 90 patients. 30 patients in the control group, 30 patients in the band group, and 30 patients in the pressure group.	• The control group received antiemetic given 30 minutes before chemotherapy. • The band group gets the acupressure wristbands. The wristband was an elastic bracelet with 1 cm protruding round plastic buttons (studs). Patients wear wristbands with stud pressing P6 acupoint • The pressure group applied pressure to the patient's wrist for a total of 30 minutes (15 minutes on each wrist). Pressure was applied 30 minutes before chemotherapy was given	Nausea-vomiting chart.	The vomiting episodes increased in controls and pressure group, but a steady decrease in the acupressure wrisrtband group and this result was statistically significant ($p<0.05$).

				• All groups received standard antieimetics.		
3.	Tan et al (2022) China	RCT	114 breast cancer patients undergoing chemotherapy, patients were randomly allocated 38 patients to the AA group, 38 patients to the sham AA group and 38 patients to the control group.	• The AA group used vaccaria seeds attached to 7 ear points. The patient was instructed to press the seed until it reaches a tingling sensation. Performed 3 times a day (morning, afternoon, and evening) for 5 days. The sham AA group were given Junci Medulla at the ear acupoints, and instructed to press the seeds gently • All groups received standard antieimetics.	• Functional Assessment of Cancer Therapy-Breast (FACT-B) • Index of Nausea, Vomiting and Retching (INVR)	The AA and sham groups reported better CINV outcomes than the standard care group, with true AA showing a greater effect than sham comparisons.
4.	Eghbali et al (2016) Iran	RCT Crossover	The study was conducted on 48 women with breast cancer who were undergoing chemotherapy. The patients were selected from two hospitals located in the urban areas of Iran. The study units were selected based on two groups at random, group A and group B.	• The AA method was carried out through this procedure: before chemotherapy, both earlobes were cleaned using 75% alcohol and then zero point, stomach point, brain stem point, shenmen point, and cardia point which were effective for controlling nausea and vomiting were identified. Then, the researchers placed the ear buds at each seed and attached them with a special non-latex adhesive. After that, the researchers trained the patients to press each point at least 3 times each day (morning, afternoon and evening) for 3 minutes for 5 days. When the patient was referred for a second cycle of chemotherapy after three weeks, the interventions of the two groups A and B were swapped. • All groups received standard antiemetics.	Morrow standard questionnaire	Using of auricular acupressure caused a decrease in the number and intensity of nausea and vomiting in the acute phase and delayed phase in the experimental group which was significantly lower than the control group (p=0.001).

5.	Genç & Tan (2014) Turkey	Quasy experimental study	Sample of this study was 64 patients with stage 1-3 breast cancer who undergoing chemotherapy in an outpatient chemotherapy unit. 32 patients in the intervetion group and 32 patients in the control group	The intervention group received an acupressure wristband. Patients were asked to continue to wear the wristbands on both wrists for five days. They were also asked to fill in the nausea and vomiting index at the same time each night.	• Beck Anxiety Inventory (BAI) • Index of Nausea, Vomiting, and Retching	It was found that the mean score of nausea and vomiting, total (experiences, events, and distress), and mean anxiety scores for patients who acupressure applied to the P6 acupoint was statistically significantly lower compared with the scores of patients in the control group.
6.	Peoples et al (2019) US	RCT	242 breast cancer patients were taken from January 2013 to March 2017 and divided into 3 groups.	• Intervention acupressure wristbands group and hope-raising materials were hope-raising handouts on acupressure bands and relaxation MP3 recordings that expectancy-enhancing • Acupressure bands group and expectancy-neutral material given expectancy-neutral handout concerning acupressure bands and MP3 recording containing expectancy-neutral relaxation • The control group only received neutral hope leaflets without acupressure tape. • All groups received standard antitimetics.	Nausea and vomiting were recorded in a diary for five days reported by the patient.	Acupressure wristbands combined with relaxation MP3 recording were effective in reducing nausea and vomiting for patients.
7.	Shen & Yang (2017) Taiwan	Quasy experimental study	70 lung cancer patients undergoing chemotherapy. 35 patients in the control group and 35 patients in the intervention group.	• The intervention group was given acupressure therapy. This therapy was carried out for 3 minutes by pressing PC6 acupoints and SP4 • The control group received patches at SI3 acupoint. This therapy carried out for 12 minutes.	Morrow assessment of nausea and emesis (MANE)	The mean of meridian energy in the experimental group after acupressure was significantly higher than control group (F 28.71, p<0.001)

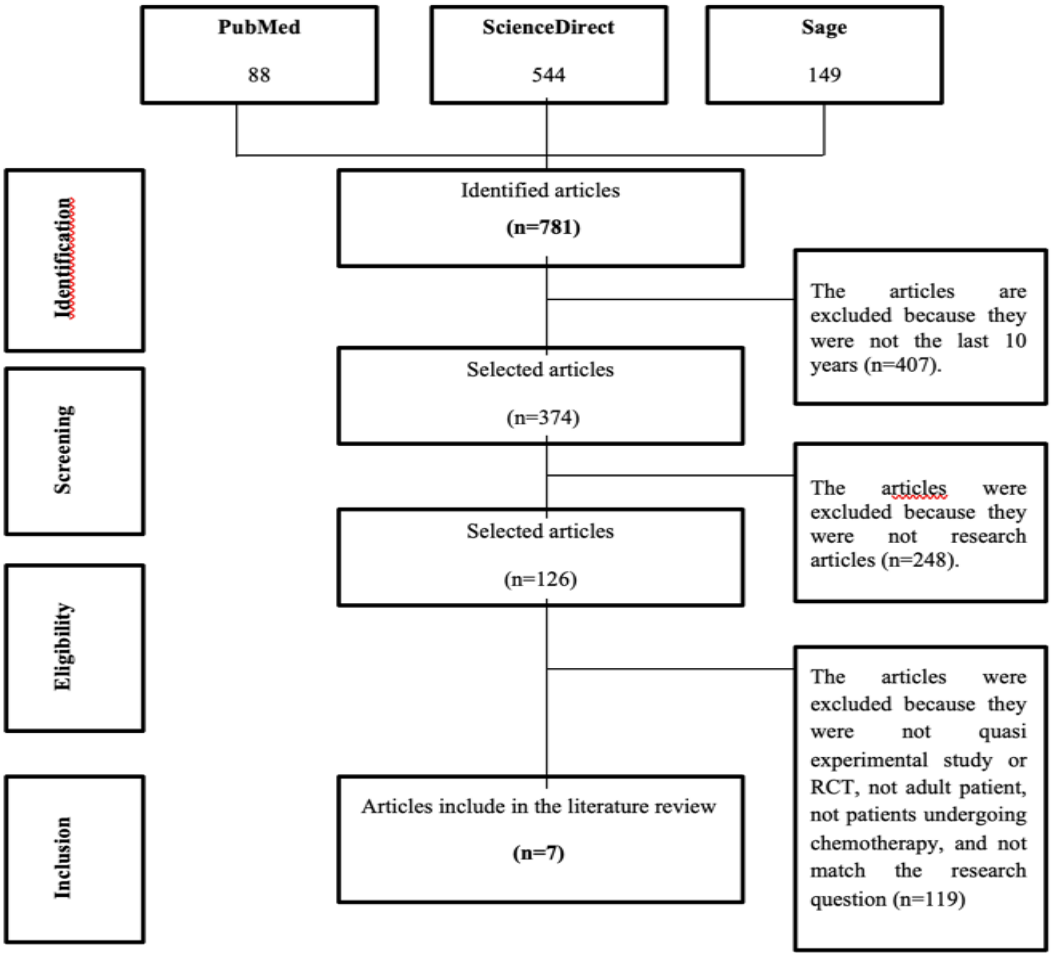

Figure 1. Flow Diagram Of Study Selection

IV. DISCUSSION

This literature review found several types of acupressure used in CNIV patients.

1. Band Acupressure

   The acupressure band was an elastic band that has a button/seed of 1 cm that is used 3 fingers below the wrist, the button/seed was located right at the P6 point of the wrist (Avci et al., 2016). Stimulation of the P6 point has benefit in some conditions of nausea and vomiting (Ezzo et al., 2006). Using of acupressure bands was intended to stimulate the P6 point (Molassiotis et al., 2014). According to Genç & Tan (2014) using of acupressure wristband can reduced the average score of nausea, vomiting, and anxiety in breast cancer patients undergoing chemotherapy. Using of acupressure wristband was also effective in reducing nausea and vomiting in acute myeloblastic leukemia patients undergoing chemotherapy (Avci et al., 2016). In addition, giving acupressure wristband combined with relaxation music had also been shown to be able to reduce nausea and vomiting in breast cancer patients undergoing chemotherapy (Avci et al., 2016). Emphasis on point P6 provides relaxation, increases the energy of the meridians thereby relieving symptoms of nausea and vomiting (Shen & Yang, 2017).

Acupressure wristband therapy at P6 acupoint can also reduced acute phase nausea and vomiting after chemotherapy in cervical cancer patients (Yulianasari et al., 2020). Giving acupressure therapy used needle stickers can reduce nausea and vomiting in cancer patients undergoing chemotherapy (Jang & Park, 2011). Wristband acupressure is recommended as a nursing intervention consideration in treating cancer patients with nausea and vomiting, because the use of wristband acupressure and antiemetics has a significant effect in reducing nausea and vomiting of cancer patients undergoing chemotherapy (Fatma, 2019). The application of acupressure on the P6 acupoint in children with acute leukemia undergoing chemotherapy also provides a significant reduction in nausea and vomiting (Yousef et al., 2018). According to Ghezelbash & Khosravi (2018) the one-time application of acupressure can reduced the intensity of nausea immediately after the intervention. The acupressure wristband on the P6 acupoint had the effect of reducing nausea and vomiting (Park & Shin, 2020).

However, Molassiotis et al (2014) Alexander's research stated that there was no significant effect between the acupressure wristband group and the control group. It was possible that the patients who reported adherence did not apply the acupressure wristband properly (Dupuis et al., 2019). According to Molassiotis et al (2014), during interviews conducted with some patients (two out of nine in the fake group) used the wristband as in the real group because they had seen it on the Internet or seen other people wearing it correctly. This may contaminate the results and it is impossible to make a different bracelet that will look identical to the original but not have buttons or apply pressure (Molassiotis et al., 2014).

2. Auricular Acupressure
   Auricular Acupressure (AA) was a form of auricular therapy that used botanical seeds (or pellets) that are attached to acupoints in the ear to produce (Zhong et al., 2019). According to Jang & Park (2011), performing AA at the Sympathetic (AH6a), Shenmen (TF4), Liver (CO12), Stomach (CO4), Spleen (CO13), Cardia (CO3), and Subcortex (AT4) points can reduced nausea and vomiting in breast cancer patients who have had breast cancer undergoing chemotherapy. Eghbali et al (2016) also revealed the same thing, namely the AA intervention at Shenmen, Point Zero, Stomach, Cardia, and Brain Stem caused a decrease in the intensity of nausea and vomiting in breast cancer patients undergoing chemotherapy. AA therapy can reduced nausea and vomiting due to chemotherapy (Shin & Park, 2018). In addition, AA therapy combined with antiemetics also reduces nausea and vomiting in the delayed phase (Chen et al., 2021)

V. CONCLUSION

Based on this literature review, acupressure has been shown to reduce nausea and vomiting in chemotherapy patients. Therefore, acupressure can be recommended as a helpful therapy, non-pharmacological methods for some cancer-related chemotherapy-induced nausea and vomiting management. Further research is needed on the use of appropriate types of acupressure based on the type of cancer suffered by the patient.

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