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Non-pharmacological management for chemotherapy-induced nausea and vomiting in patients with cancer: a scoping review†

Review

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Abstract: **Objective:** This review aimed to map and summarize published studies that tested non-pharmacological management for chemotherapy-induced nausea and vomiting (CINV).

Methods: We searched for eligible studies in 5 electronic databases and screened the retrieved studies using the inclusion and exclusion criteria. Data were then collated according to the types of interventions, measurement tool, and outcomes.

Results: The search yielded 2343 records, of which 11 were included. Four categories of non-pharmacological CINV management were made; manipulative and body-based therapy (n = 5 studies); mind–body therapy (n = 3 studies); biologically based practice (n = 1 study), and energy therapy (n = 2 studies). Seven different scales were used to measure CINV. Nine studies reported improvement in CINV.

Conclusions: This scoping review demonstrates the breadth of non-pharmacological management to address CINV. Various types of CINV scales were used to measure CINV severity. The management and scale can be utilized to improve nursing care, particularly in cancer care.

Keywords: *cancer • chemotherapy-induced nausea and vomiting • complementary therapies • nausea and vomiting • review*

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1. Introduction

The prevalence of cancer is increasing every year globally with approximately 19.3 million new cases in 2020.[1] Patients with cancer experience several symptoms that may be primary or due to the impacts of the treatment. Chemotherapy-induced nausea and vomiting (CINV) is one of the most common adverse effects among patients undergoing chemotherapy.[2] CINV is experienced in varying degrees and increases the cancer burden of patients, and suboptimal CINV management negatively impacts the physical, psychological, and social functioning of the patients, leading to a decrease in the quality of life.[3,4]

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The incidence of CINV is high; for instance, a study in Jordan reported that 71.4% of patients who undergo chemotherapy suffered from CINV,[5] while an Italian study reported an incidence between 40% and 70%.[6] Although the incidence is high and the negative effect exists, such symptoms continue to be underestimated and undertreated by nurses and physicians. Therefore, it is important to prevent and control CINV, in which nurses can play a substantial role.[7] Nursing care that addresses physical needs, such as recovering from the adverse effects of cancer treatment, especially CINV, is a critical unmet need.[8]

Nurses can provide nursing interventions that include non-pharmacological management and collaborate with physicians in managing CINV. The Oncology Nursing Society recommends the use of a non-pharmacological approach alone or in combination with pharmacological measures to prevent, manage, and treat CINV.[9] Generally, the pharmacological treatment for CINV is 5-HT_3 antagonist therapy combined with corticosteroid therapy.[5] However, the management of CINV remains inadequate due to poor adherence to existing antiemetic guidelines.[10] In addition, the treatment often adds to the symptom burden experienced by patients across physiological, emotional, and mental domains, which leads patients to complementary and alternative medicine.[11]

Available non-pharmacological management of CINV includes ginger extract, massage and inhalation aromatherapy, dietary counseling, and auricular acupressure. The available interventions can potentially have a positive impact on CINV. However, to date there is no available summary of the potential non-pharmacological management for patients with cancer and experiencing CINV. Therefore, there is a need to map and summarize the available evidence on non-pharmacological and nurse-led interventions for managing CINV. This scoping review aimed to map and summarize published research on non-pharmacological interventions tested to manage CINV.

2. Methods

2.1. Research design

A scoping review was carried out. Scoping reviews map the available literature and provide an overview of the evidence to provide contextual information or concepts.[12] In contrast to systematic review, practical guidance states that critical appraisal of individual studies is not required in a scoping review.[12,13]

The methodological guideline from Arskey and O'Malley[14] was used as a frame for this scoping review. The steps include: (a) identification of research questions, (b) identification of relevant studies, (c) selection of studies, (d) mapping data, and (e) compilation, summary, and reporting of results. Arskey and O'Malley[14] state that the method of identification of the sample is iterative, requires researchers to interact with each phase reflexively, and if required, repeat the steps to ensure that the literature is thoroughly discussed. This approach allows reviews to extract and create data meaningfully and comprehensively manner.[15] Details of each steps as explained by Cooper et al.[16] are also adopted in the current review. For example, in the step of defining the study aim and research questions, we stated the purpose for scoping review and a well-defined research question to guide the scope of the review. A well-defined research question that includes the scope of the study is fundamental, as it will allow researchers to conduct a more practical and efficient review.[17] The scoping review questions address Patient Concept and Context (PCC). There were 2 research questions for the review: (1) What type of non-pharmacological interventions (Concept) for CINV (Population) have been trialed on patients with cancer (Context)? (2) How has CINV been assessed in available studies?

2.2. Search strategy

In the scoping review checklist developed by Cooper et al.[16], an in-depth literature and comprehensive search is required to enable identifying the relevant literatures. In the scoping review, 4 electronic databases were searched: PubMed (Medline), CINAHL, PsycINFO, Scopus, and Cochrane to identify published studies meeting the inclusion criteria. We determined keywords based on the research questions before identifying the relevant journal articles. MeSH search keywords were then used jointly: "nausea or vomiting," "chemotherapy," "non-pharmacological," and "complementary therapy." The keywords were searched individually, then combined using the Boolean term AND. Box 1 shows an example of the search strategy used in Cochrane.

Box 1. Logic grid search example in Cochrane database.

#1	nausea OR vomiting (*n* = 59058)
#2	chemotherapy (*n* = 85319)
#3	cancer (*n* = 193085)
#4	non-pharmacological with Cochrane Library publication date between January 2015 and January 2021 (*n* = 2829)
#5	#1 AND #2 AND #3 AND #4 with Cochrane Library publication date between January 2015 and January 2021, in Trials (*n* = 10)

The Participants/Concept/Context structure was used to define the scoping review search strategy:

(P) Population: patients with cancer experiencing CINV
(C) Concept: non-pharmacological management
(C) Context: cancer care
During the data selection process, we defined a clear inclusion and exclusion criteria and conducted an iterative process to select the relevant studies as suggested by Cooper et al.[16]. Inclusion criteria for this review included: (i) studies or interventions that addressed non-pharmacological management for CINV, (ii) adult patient with cancer and experiencing CINV as participants, and (iii) studies published from 2015 onwards, to ensure relevancy to current nursing practice. The exclusion criteria for this review include: (i) qualitative studies, (ii) review paper, and (iii) publications in language other than English.

2.3. Study selection

All identified records in the initial search were exported to Endnote X9 Software (Clarivate Analytics, PA, USA) and duplicates were automatically removed using it. Two reviewers (DM and ER) independently assessed the articles based on the relevance according to titles, abstracts, and full-text information. Subsequent to the individual review, all reviewers gathered to discuss the review following the inclusion criteria. Any discrepancies between the 2 reviewers at any stage of the selection process were discussed and settled with the third reviewer.

First, we independently examined relevant studies using the information of titles and abstracts and retrieved the full-text for all studies that met the eligibility criteria. The 2 reviewers independently (DM and ER) assessed the full-text of the articles to confirm that they met the inclusion criteria. Following that, the reviewers gathered to discuss the analysis.

2.4. Extraction of results

The goal of this scoping review was to map and summarize the available literature related to CINV non-pharmacological management from 2015 onwards. A table for extracting details, characteristics, and result of studies based on the Joanna Briggs model was developed.[13] In the fourth stage of the review, we charted the data. To capture all of the relevant information and ensure that no important information was missed, each of the 11 selected full-text papers was thoroughly read several times by the 2 authors. The papers' dataset was built by extracting the results relevant to the questions asked. The review authors discussed the design of this dataset to ensure that all relevant information was included. Categories included in the data extraction tool and spreadsheet were as follows: (a) author and publication year, (b) aim of the study (c) setting for study (country, hospital, clinic), (d) study design, (e) participants (number of participants, age, type of cancer), (f) intervention (type, duration, length), (g) outcome measures used, (h) study outcomes, and (i) category of interventions.

3. Results

A total of 2343 papers were identified, and there were 25 duplicates (Figure 1). After removing duplicates, 2318 articles were reviewed by examining their title and abstract, resulting in the exclusion of 2307 articles that were not relevant to the study aim. Finally, a total of 11 full-text of papers were reviewed.

3.1. Description of included studies

Table 1 shows the descriptive data for each included study including the following: study descriptive, research design, participants, measures, intervention and its category, and findings. Most of the studies, approximately one-third (36.4%), were conducted in Turkey, followed by China (18%) and Iran (18%). Each of the following 3 countries published a single study during the period under review: Canada, Jordan, and the United States. After reviewing the literature, we summarized the availability of non-pharmacological therapy and its types, and instruments for measuring the outcomes of interventions.

3.2. Participants

The total number of participants included in the review was 1159. The number of participants in each included study ranged from 40 to 240, and the average sample size of the included studies was 105. Approximately two-third of the studies (72.7%) had samples of 50–150 participants. The remaining studies included >150 (18.2%) or <50 (9%) participants. The combined mean age of participants in the included studies was 52.18 (SD = 10.51). The populations studied were predominantly diagnosed with breast cancer (n = 7, 63.6%). Four studies involved patients with different cancers such as lung, ovarian, cervical, gastrointestinal, hematology, and respiratory. Of 11 studies, 6 studies included patients with cancer from stages I–III. Regarding the setting of the included study, 4 studies were conducted in the ambulatory oncology unit, 1 study was conducted in the cancer wards, and the remaining studies did not explicitly state the setting. All the studies reported that the participants received standard treatment with antiemetics and non-pharmacological interventions.

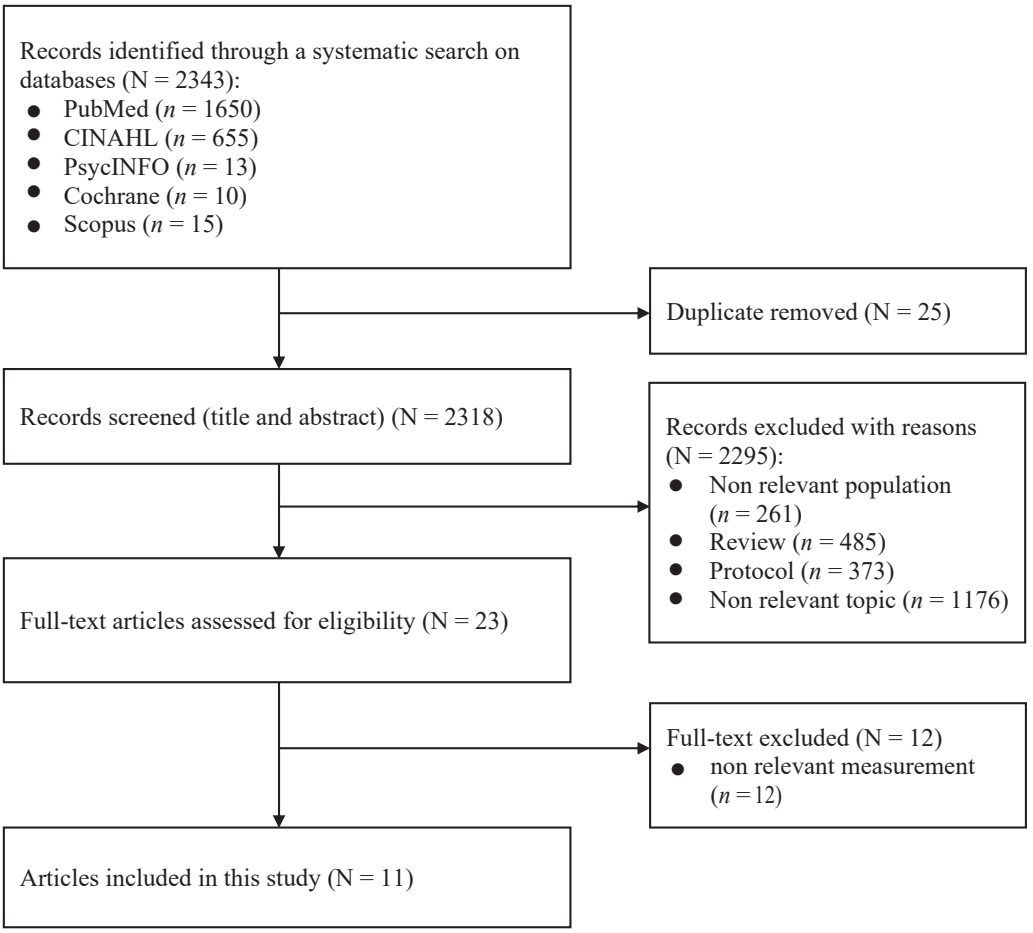


Figure 1. PRISMA process of the systematic literature search.

3.3. Characteristics of non-pharmacological interventions for CINV

Most of the reviewed studies predominantly included an experimental group and a control group (n = 10 studies, 90.9%) and 1 study (9.1%) incorporated an additional experimental group. There are various non-pharmacological interventions for CINV, including acupuncture, the use of the hologram bracelet, reflexology, yoga, breathing exercise, consumption of ginger extract, massage and inhalation aromatherapy, peppermint aromatherapy, auricular acupressure, and the use of acupressure wrist band. We categorized the interventions applied in the studies based on Millstine's category of complementary and alternative therapy.[29] The categories include manipulative and body-based therapy; mind–body therapy; biologically based practice, and energy therapy. Manipulative and body-based therapy is based on the belief that the human body can regulate and heal itself and that its parts are interdependent. Therapies in the manipulative and body-based therapy include: massage, reflexology, cupping, and acupuncture.[29] Another category, that is, mind–body therapy is primarily based on the theory that mental and emotional factors regulate physical health by connecting between hormonal, and immunologic throughout the body. The mind–body therapy includes biofeedback, guided imagery, hypnotherapy, meditation, including mindfulness, and relaxation.[29] The category that is biologically based practices uses naturally occurring substances to affect health. This type of therapy includes the following: botanical medicine and natural products, chelation therapy, and diet therapies.[29]

Most frequently, the studies focused on manipulative and body-based therapy, such as massage and inhalation therapy,[20] acupressure bands,[21] auricular acupressure,[22] Bali yoga,[18] and reflexology.[19] Mind–body therapy includes interventions such as guided imagery,[24] breathing exercises,[25] and peppermint oil.[23] Two studies focused on energy therapy: hologram bracelets[27] and acupuncture.[26] The last category was

No.	Author(s)	Aim	Design	Participants	Intervention	Measurement	Results	Category of non-pharmacological therapy
1.	Anestin et al.[18]	To determine the effects of a standardized yoga program on CINV among breast cancer patients	Randomized controlled trial (single blind)	82 patients (n = 52 in intervention, n = 30 in control). The mean age is 50.4 (SD = 8.9). The characteristics: be 18 years or older, have a breast cancer diagnosis (stages I–III), receive chemotherapy, consent from medical team, no regular practice of yoga, no current psychotherapy, no psychiatric diagnosis, and no heart failure	8 weekly group sessions of 90 min with 5 participants per group, led by a trained instructor. Participants were also given a DVD of the intervention with a 20- and 40-min session format Antiemetic still consumed	Morrow Assessment of Nausea and Emesis Scale: frequency, intensity, worst moment, duration	There was no significant difference between the experimental and control groups on CINV after 8 weeks	Manipulative and body-based therapy
2.	Özdelikara and Tan[19]	To determine the effect of reflexology on chemotherapy induced nausea, vomiting, and fatigue in breast cancer patients	Pretest and posttests experimental design	60 patients with breast cancer stages I–III in Ataturk Hospital, Turkey Mean age: 50.93 ± 11.27 in the experimental group and 51.06 ± 10.97 in the control group	Three sessions of reflexology by a trained nurse (one in each of 3 chemotherapy cycles). Each reflexology session took approximately 30–40 min. Antiemetic treatment was still consumed	Rhodes INVR	Reflexology can decrease the experience, development, distress of nausea, vomiting	Manipulative and body-based therapies
3.	Zorba and Ozdemir[20]	To evaluate the feasibility and preliminary effects of massage and inhalation aromatherapies on chemotherapy-induced acute nausea/vomiting.	Quasi RCT	75 patients with breast cancer stages I–III in an oncology polyclinic in Turkey Mean age: 44.96 (SD: 9.91) years	Group 1: receiving 20-min aromatherapy foot massage, Group 3: received 3-min inhalation aromatherapy before their second, third, and fourth chemotherapy cycles	A nausea, vomiting, and retching patient follow-up form was used to evaluate nausea severity by visual analog scale and frequency of vomiting and retching	Nausea severity was significantly lower in the massage and inhalation aromatherapy groups than in the control group. Nausea and retching incidence was reduced in the aromatherapy groups compared with that in the control group	Manipulative and body-based therapy
4.	Peoples et al.[21]	To examine the effectiveness of acupressure bands on CINV	Randomized control trial	226 patients with breast cancer stages I–III at 4 cancer clinics in USA. The total mean age was 57 (SD: 0.07). The age ranged from 24 years to 76 years old. The sample had chemotherapy regimen containing doxorubicin, or docetaxel with carboplatin, or docetaxel with cyclophosphamid	The intervention group 1: Wearing band for 5 d with MP3 enhancing relaxation Group 2: Wearing band with natural relaxation. The control group receive MP3 relaxation only	Self-report 5-d diary	Acupressure bands combined with a relaxation recording were effective in reducing nausea for patient receiving doxorubin	Manipulative and body-based therapy

(Continued)

Table 1. Continued.

No.	Author(s)	Aim	Design	Participants	Intervention	Measurement	Results	Category of non-pharmacological therapy
5.	Eghbali et al.[22]	To determine the effect of auricular acupressure in relieving nausea and vomiting among the women who received chemotherapy	Randomized control trial	48 patients with breast cancer (stages I–III) from 2 hospitals in an urban area of Iran. The total mean age was: 46.02 (SD = 7.23) and the age ranged: 32–65 years old	The researcher placed an ear seed on each point and pasted it with a special non-latex adhesive. The researcher trained the patients to press each point at least 3 times every day (morning, noon, and night) for 3 min. Auricular acupressure for 5 d until started having mild tingling sensation or a slight sense of discomfort	Morrow Assessment of nausea and vomiting	The use of auricular acupressure decreased in the frequency and intensity of nausea and vomiting in both the acute and delayed phases in experimental group	Manipulative and body-based therapy
6.	Efe Ertürk and Taşcı[23]	To evaluate the effects of peppermint oil on the frequency of nausea, vomiting, retching, and the severity of nausea in cancer patients undergoing chemotherapy	A quasi-randomized controlled study	90 patients from ambulatory chemotherapy unit in Turkey. The mean age of the patients in the intervention group was 49.94 (SD = 10.47) in the control group: 54.63 (SD = 10.15). The participants' diagnosis include: breast cancer, colon cancer, ovary cancer, lung cancer, rectum cancer, and pancreas cancer	The participants in the intervention group applied one drop of the aromatic mixture on the spot between their upper lip and their nose, 3 times a day for the 5 d following chemotherapy administration, in addition to the routine antiemetic treatment	Visual analog scale for nausea severity. INVR	The VAS nausea score was significantly lower after peppermint oil applying in the patients receiving Folfirinox; Paclitaxel-Trastuzumab; Carboplatin-Paclitaxel and Cyclophosphamide-Adriamycin excluding cisplatin schedule	Mind–body therapy
7.	Hosseini et al.[24]	To examine the effect of guided imagery on CINV in breast cancer patients	Quasi experimental study	55 female patients with breast cancer (stages I–III) in an Iranian hospital. The mean age of 57.5 years (SD = 8.43)	The patients were asked to listen to 2 audio-recorded guided imagery scripts, formatted as 2 separate tracks on 2 CDs. Each track was 10 min in length to elicit imagery response. The first track consisted of soft, slow-tempo, mixed nature sounds. The second track of the intervention included a pleasant scene imagery script. Antiemetic was consumed	Morrow assessment of nausea and vomiting	Mean score of nausea and vomiting severity decrease after the intervention	Mind–body therapy

(Continued)

Table 1. Continued.

No.	Author(s)	Aim	Design	Participants	Intervention	Measurement	Results	Category of non-pharmacological therapy
8.	Aybar et al.[25]	To determine the effect of breathing exercise on nausea, vomiting, and functional status in breast cancer patients undergoing chemotherapy	Randomized controlled trial	60 patients with breast cancer stages I–IV in an ambulatory chemotherapy unit in Turkey. The mean age of the patients in the intervention group was 43.03 (SD = 7.07) in the control group: 51.43 (SD = 9.46).	Trained patients with breathing exercise 15–20 patients. Patients then were asked to do breathing exercise at least 5 min in case of sensation of nausea and vomiting, for 6 d With antiemetic	Visual Analog Scale	The patients in the intervention group had less number of nausea, vomiting, and retching episodes after the breathing exercise ($P < 0.05$) and experienced lower severity of nausea ($P < 0.05$) compared with patients in the control group	Mind–body therapy
9.	Li et al.[26]	To compare the effectiveness of true acupuncture vs. sham acupuncture in controlling CINV among patients with advanced cancer	Randomized controlled trial	134 participants from 4 hospitals in China. The mean age of the patients in the intervention group was 60, median 56.84–60.48), and in the control group: 58 median 54.99–60.04 The participants' diagnosis include: breast cancer, ovary cancer, cervical cancer, endometrial cancer and lung cancer (stages I–IV) The patients received cisplatin, anthracycline, or taxane-based chemotherapy regimens	Participants in both groups received acupuncture session twice (30 min) on the first day of chemotherapy, and once consecutively on the following 4 d. (total 5 d) Patients in the study were randomized in a 1:1 ratio into a TA or SA group receiving the following acupuncture treatment	The primary outcome was using the CTCAE to assess CINV	Compared with the SA group, the TA group did not show significant improvement in complete response rates of CINV (all $P > 0.05$). However, the True acupuncture group could modestly reduce the severity of nausea (from day 3 to day-21, $P < 0.05$) or vomiting (from day-4 to day-21, $P < 0.05$), which is notably superior to the control group	Energy therapy
10.	Akhu-Zaheya et al.[27]	To assess the clinical effectiveness of the hologram bracelet in the management of CINV among adult patients with cancer	Experiment double blinded	In a cancer center in Jordan 175 oncology patients were randomly assigned to 3 groups: placebo (n = 53), control (n = 54), and intervention (hologram bracelet) (n = 68). The mean age was 42.3 (SD = 14) years, and ranged from 18 years to 75 years. Types of cancer: Breast cancer, Hematology, Gastrointestinal, Respiratory, Genitourinary, Gynecology and Head and neck Bone.	Hologram bracelet worn for 5 d	The Functioning Living Index Emesis was used to examine the impact of CINV	The mean total Functioning Living Index Emesis score was significantly lower in the intervention group for total vomiting and total nausea	Energy therapy

(Continued)

Table 1. Continued.

No.	Author(s)	Aim	Design	Participants	Intervention	Measurement	Results	Category of non-pharmacological therapy
11.	Li et al.[28]	To examine the efficacy of ginger, as an adjuvant drug to standard antiemetic therapy, in ameliorating acute and delayed CINV in patients with lung cancer receiving cisplatin-based regimens	Randomized controlled trial	140 patients with lung cancer from 3 cancer wards in a Hospital, China. The mean age: 57.52 (SD = 7.24) in intervention group. And 57.46 (SD = 7.82) in placebo group. Chemotherapy regimens are: cisplatin, carboplatin, oxaliplatin	Ginger root powder was administered orally (0.5 g, 2 capsules/d, 0.25 g/capsule, every 12 h) for 5 d beginning on the first day of chemotherapy	MASCC Antiemesis Tool (MAT)	As an adjuvant drug to standard antiemetic therapy, ginger had no additional efficacy in ameliorating CINV in patients with lung cancer receiving cisplatin-based regimens	Biologically based therapy

Note: CINV, chemotherapy-induced nausea and vomiting; DVD, digital video disc; VAS, Visual Analog Scale; CDs, compact discs; SA, sham acupuncture; TA, true acupuncture; CTCAE, common terminology criteria for adverse events; INVR, index of nausea, vomiting, and retching; MASCC, Multinational Association of Supportive Care in Cancer.

Table 1. Data extraction.

biologically based therapy that included interventions such as ginger extract.[28]

The interventions in the included studies were conducted by nurses, either a general nurse[24,25,28] or those who had trained and certified in the particular intervention.[19] Other included studies did not provide in detail who had conducted the interventions. The interventions varied based on content or intent, as well as on duration and intensity. The durations of the interventions for the participants ranged from 5 d to 3 chemotherapy cycles. The interventions included at least 3 min of auricular acupressure per day for 5 d,[22] 90 min of yoga over 8 weeks,[18] and 30–40 min of reflexology per cycle for 3 cycles of chemotherapy.[19] Six studies reported that the duration of the interventions was 5–6 d, and the intensity of the intervention was 20–40 min/d. Other interventions in 3 studies were conducted for 3 chemotherapy cycles, while 1 study reported that the majority of the interventions were provided daily within 5 d. The interventions in these studies ranged from 5 d of breathing exercises for 5 min to reflexology and combined massage and inhalation therapy during each chemotherapy session conducted for up to 3 chemotherapy cycles. Two studies included an in-depth assessment of fatigue as recommended in the NCCN clinical guidelines.[30–32]

Three studies that were included in the mind–body therapy provided details of how the interventions were carried. For example, the authors explain the guided imagery intervention that contains 3 sessions of listening 2 tracks of audio-recorded guided imagery.[24] First, the patients were provided with small and easy-to-use headphones to prevent environmental noise to ensure their concentration on the audio. Then, the patients in the intervention group were asked to listen to the first track the night before the third session for 10 min. The first track included the soft and slow tempo as background music, and the second track consisted of a pleasant scene of imagery scripts. The researcher in Hosseini et al.'s[24] study asked the patients to write the frequency and severity of their nausea and vomiting during and after the intervention.

An aromatherapy practice guide was developed and stated in the study conducted by Erturk and Tasci.[23] The procedure for aromatherapy is as follows: (1) getting permission after explaining the study; (2) choosing a quiet and comfortable place; (3) handwashing for the practitioner; (4) dropping 1 drop of pre-prepared aromatic oil and applying between patient's lip and nose and asking patients to take a deep breath; (5) tightly closing the cap of the aromatherapy bottle; (6) repeating the protocol for 5 d at the same hour in the morning, at noon, and in the evening; and (7) documenting the procedure and writing down any problems related to aromatherapy administration.[23]

3.4. CINV measurement

All the studies based their measurement solely on patient-reported outcome measures, such as existing CINV inventories (90.9%) and diaries (9.1%). Seven different scales were used to measure CINV. The most common measures were the Morrow Assessment Scale[22,18,24] and the visual analog scale.[20,25,23] Other inventories were the Common Terminology Criteria for Adverse Events (CTCAE)[26]; functioning Living Index Emesis[27]; self-report diary[21]; Rhodes INVR[19]; and the MASCC Antiemesis Tool[28] (Table 2).

3.5. Outcome of the intervention

All the reviewed studies included pre- and post-measurements, whereas none of them included follow-up measures. Reductions in the frequency and severity of nausea as the primary outcome were specified in all the studies. Over two-third of the studies (72.7%) reported a significant improvement in CINV based on frequency and severity immediately after the intervention. The patients who were provided the following interventions had less number of nausea and vomiting and significant improvement on their conditions. The following interventions are auricular acupressure and acupressure band[21,22]; inhalation and massage[20]; peppermint oil[23]; guided imagery[24]; reflexology[19]; breathing exercise[25]; and hologram bracelet.[27] Among the 11 reviewed studies, 3 reported no significant CINV changes after measurement. The interventions that did not have a positive outcome include Bali Yoga, acupuncture, and the administration of ginger root powder.[18,26,28]

CINV outcome measure	Used in N trials	Language other than English
Morrow Assessment Scale	3	1
Visual Analog Scale	3	
CTCAE	1	
Functioning Living Index Emesis	1	
MASCC antiemesis tool	1	
Rhodes INVR	1	
Self-reported diary	1	

Note: CINV, chemotherapy-induced nausea and vomiting; CTCAE, common terminology criteria for adverse events; INVR, index of nausea, vomiting, and retching; MASCC, Multinational Association of Supportive Care in Cancer.

Table 2. Used CINV outcome measures.

4. Discussion

In this scoping review, 7 of the 11 included studies focused on patients with breast cancer. This confirms the previous review on intervention for cancer-related fatigue conducted by Pearson et al.[33] These authors identified that the majority of included studies were the breast cancer population, while relatively few trials focused on people with other types of cancers. The results of our review show that manipulative and body-based therapy, mind–body therapy, energy therapy, and biologically based therapy represent the common non-pharmacological interventions for CINV. The majority of findings from the studies corroborate the positive effects of non-pharmacological therapy with the standard antiemetics for managing CINV.

The reviewed literature pinpointed several interventions which positively decrease the severity and frequency of CINV. The interventions were auricular acupressure and acupressure band[21,22]; inhalation and massage[20]; peppermint oil[23]; guided imagery[24]; reflexology[19]; breathing exercise[25]; and hologram bracelet.[27] Several studies provided detail explanations on how the interventions were carried out and the interventions were conducted by nurses.[20,25,23] The procedure guideline that was provided in the included studies could be a further guidance for nurses in the clinical setting. Breathing exercise as an independent nursing intervention presented promising results for improving CINV as it is easy and does not need any instruments. The mechanisms of change that lead to reduced CINV severity are still unclear, but a trial stated that breathing at a rate 3–7 rpm can be a protective factor against emesis, particularly motion sickness.[34]

The inclusion criteria of this review were met by very few primary studies on some intervention. There is limited evidence that most of the measures were successful types recommended in all treatment guidelines, such as breathing exercises, acupuncture/acupressure, and guided imagery. However, there are challenges in interpreting the results due to a lack of homogeneity of the antiemetic drugs as the main treatments of CINV with components that have not been evaluated separately in an RCT.[10] The NCCN guidelines recommend that patients should be protected from CINV by prescribing antiemetic therapy before chemotherapy and for up to 4 d later.[32] Surprisingly, only 1 study referred to the recommendation of the method. Prospective evaluation of the practice guidelines and further research into commonly prescribed interventions are needed to increase the level of evidence for the current guidelines.

The review highlighted variations in the self-reports used to measure CINV of the included studies, which can limit the comparison of studies. This also means that the same construct or domain may not have been assessed.[35] Most of the measures in the studies are valid and reliable in practical clinical settings.[36,37] However, they are not recommended as primary measures in research studies because of issues of validity and reliability.[38] Although there is no gold standard for CINV assessment,[35] the lack of recommendations may hinder research. More rigorous study eligibility criteria related to CINV and a recommended shortlist of robust instruments or methods for assessing the severity, duration, and effects of CINV will facilitate a better understanding of CINV.[6]

A strength of this review is that scoping was conducted according to a standard methodology. In addition, the search was comprehensive, and it included the non-pharmacological interventions for CINV and their outcomes and the available CINV tool. Most of the papers describe the interventions in detail, which may inform the implementation of interventions in clinical practice.

However, there are limitations to the scoping review. We only searched and included the published literature in English for our review, which may have caused missing relevant information from studies reported in languages other than English. The date and language limitations we set may have excluded some relevant studies. In addition, we excluded qualitative studies so that awareness or perceptions of nurses in the area of managing the symptoms with non-pharmacological interventions which may be more relevant for nursing cannot be summarized in this review.

5. Conclusions

Most patients undergoing chemotherapy experience CINV. This review maps several types of non-pharmacological interventions for CINV in people with different cancers. The use of consistent CINV inclusion criteria and a smaller selection of robust outcome measures that assess the severity, duration, type, and effect of CINV may enable a more accurate estimate of the effectiveness of interventions and allow comparisons across studies. The findings from this study have important implications for nursing practice. Integrating non-pharmacological interventions with standard antiemetics can improve CINV. This highlights the importance of facilitating and improving the use of non-pharmacological interventions in clinical settings.

6. Implication for nursing practice, policy, and research

This study highlights the importance of non-pharmacological management for patients experiencing CINV. This scoping review provides evidence from studies of non-pharmacological interventions relevant to manage CINV that can be administered by either a general or certified nurse. In practice, nurses spend more time with patients and must be prepared with strategies to identify and manage CINV. Updated information on non-pharmacological interventions to complement standard antiemetics treatment is critically needed to address CINV and to provide quality nursing care.

This review identified non-pharmacological interventions which have proved, through clinical studies, to be effective for managing CINV. Therefore, this scoping review also makes a substantial contribution to the development of a practical and evidence-based clinical guide for nursing, with recommendations that can be adapted to deliver quality nursing care. The development of nursing policies should be based on evidence-based practice to enable a more feasible framework to implement non-pharmacological symptom management, particularly CINV, for patients undergoing chemotherapy.

Ethical approval

Ethical issues are not involved in this paper.

Conflict of interest

All contributing authors declare no conflicts of interest.

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