The Effects of P6 Acupressure and Nurse-Provided Counseling on Chemotherapy-Induced Nausea and Vomiting in Patients With Breast Cancer

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Purpose/Objectives: To evaluate the effects of pericardium 6 (P6) acupressure and nurse-provided counseling on chemotherapy-induced nausea and vomiting (CINV) in patients with breast cancer.

Design: Randomized, controlled trial.

Setting: A university cancer center in Seoul, South Korea.

Sample: 120 women who were beginning their second cycle of adjuvant chemotherapy after definitive surgery for breast cancer and who had more than mild levels of nausea and vomiting with the first cycle of chemotherapy.

Methods: Participants were assigned randomly into four groups: control (placebo on SI3), counseling only, P6 acupressure only, and P6 acupressure plus nurse-provided counseling. The experiences of upper-gastrointestinal distress were measured by the Rhodes Index of Nausea, Vomiting, and Retching for acute (day 1) and delayed (day 2 to day 5) CINV.

Main Research Variables: Nausea, retching, vomiting, P6 acupressure, and counseling.

Findings: No significant differences were found in the demographic and disease-related variables among the four groups. The levels of CINV were significantly different among the groups from day 2 to day 5. The CINV differences were attributed mainly to the difference between the control group and the group with P6 acupressure plus nurse-provided counseling. The effects of acupressure were proven from day 2 to day 5, and the effects of nurse-provided counseling were proven on day 4 and were close to significance level on day 5.

Conclusions: Synergic effects of P6 acupressure with nurse-provided counseling appeared to be effective in reducing CINV in patients with breast cancer.

Implications for Nursing: P6 acupressure combined with counseling by nurses is a safe and easy-to-apply tool in CINV management in practice.

Of the symptoms of chemotherapy, chemotherapy-induced nausea and vomiting (CINV) is the most prevalent and one of the hardest to manage. Women with breast cancer often suffer from CINV because chemotherapy agents for breast cancer combine various emetogenic agents, such as cyclophosphamide, doxorubicin, epirubicin, paclitaxel, docetaxel, fluouracil, and methotrexate (Bender et al., 2002; Grunberg, 2007; Newton, Hickey, & Marrs, 2009). More than half of women undergoing chemotherapy have been reported to experience CINV despite the use of antiemetic medications (Dibble, Israel, Nussey, Casey, & Luce, 2003; Lee, Dibble, Pickett, & Luce, 2005; Williams & Schreier, 2004).

The Oncology Nursing Society (ONS) Putting Evidence Into Practice guidelines on CINV management list acupuncture, acupressure, guided imagery, music therapy, progressive muscle relaxation, and psychoeducational support and information as *likely to be effective* nonpharmacologic interventions (Tipton et al., 2007). Among those interventions, acupressure and counseling provided by a nurse can be useful interventions in nursing practice because they are noninvasive, easy to apply, and can be led by nurses. Evidence supporting those modalities, however, is scarce and inconsistent.

Only three randomized, controlled trials (RCTs) have examined the effects of pericardium 6 (P6) acupressure on CINV management (Dibble et al., 2007; Molassiotis, Helin, Dabbour, & Hummerston, 2007; Roscoe et al., 2003). The P6 point is called "Neiguan" in traditional Eastern medicine and is known to be associated with nausea and vomiting. By pressing the point, the energy, which is called Qi, is believed to flow easily and reduce nausea and vomiting (Filshie & White, 1998; Gach, 1990). The P6 point is located on the anterior surface of both forearms, about three finger widths up from the wrist crease (Klein & Griffiths, 2004). The studies investigated mostly women with breast cancer, and used the P6 point

because the location is easy to access. Roscoe et al. (2003) evaluated the effects of P6 acupressure (treatment 1) and acustimulation (treatment 2) compared to a control group on CINV of 739 patients with cancer. The majority of participants were patients with breast cancer (85%) or hematologic neoplasm (10%). The level of acute (i.e., chemotherapy day 1) nausea in the acupressure group was significantly less than that of the control group ($p < 0.05$). However, in the planned subgroup analysis for female patients (92%), which is assumed to contain more homogeneous patients with breast cancer, no statistically significant differences existed in acute or delayed nausea and vomiting between the control group and either of the treatment groups.

In a multicenter RCT by Dibble et al. (2007), 160 patients with breast cancer who reported moderate levels of nausea in previous rounds of chemotherapy were assigned randomly into a P6 acupressure treatment group, a placebo treatment group (SI3 point acupressure), or a control group receiving usual care. Statistically significant reductions were observed in delayed nausea and vomiting only in the P6 treatment group compared with the placebo and control groups. Despite the supportive finding, the study had a limitation in operationalizing the P6 acupressure treatment. Participants applied P6 acupressure using the thumb of their opposite hand to a depth with which they felt comfortable every morning for six minutes plus whenever they felt nausea. However, neither tracking of the amounts of acupressure each participant applied nor comparing the changes in levels of nausea and vomiting based on the applied acupressure were pursued (Dibble et al., 2007).

In the third RCT, Molassiotis et al. (2007) used a wristband with a plastic acupressure button for P6 acupressure treatment (N = 36). Seventeen participants were asked to wear the wristband bilaterally for five days after their first chemotherapy session, whereas the control group (n = 19) received no treatment. The levels of nausea and vomiting were measured by the Rhodes Index of Nausea, Vomiting and Retching (INVR), which assesses three subdimensions: the levels of experience; actual occurrence; and distress of nausea, vomiting, and retching (Rhodes & McDaniel, 1999). The findings indicated that each subdimensional score of INVR from chemotherapy day 1 to 5 was significantly reduced in the P6 acupressure group compared to the control group, except the level of vomiting experience (Molassiotis et al., 2007). However, a small sample size, not controlling for the previous level of nausea, and the lack of description of the concealment were limitations of the study.

One non-RCT study of patients with stomach cancer also supported the effect of P6 acupressure (Shin, Kim, Shin, & Juon, 2004). The 20 patients in the experimental group reported lower levels of delayed nausea and vomiting than those of the control group (N = 40), but the study also used finger pressure on both P6 points (Shin et al., 2004). Additional RCTs using standardized P6 acupressure treatment are warranted.

Moreover, a paucity of evidence shows the effects of psychoeducational support on CINV control. A systematic review of 116 intervention studies on 5,326 patients suggested affirmative effects of psychoeducational care on reducing nausea and vomiting in cancer (Devine & Westlake, 1995). Cognitive-behavioral therapy can somewhat reduce the severity of 15 different symptoms and symptom limitations, including nausea and vomiting, of patients with solid tumors who undergo chemotherapy (Doorenbos et al., 2005; Given et al., 2004). No study to date has investigated the effects of a psychoeducational intervention solely targeting CINV control in patients with breast cancer. To fill the gap in the literature, the current study was undertaken to evaluate the effect of P6 acupressure and nurse-provided counseling on CINV reduction in breast cancer using an RCT.

Methods

Design

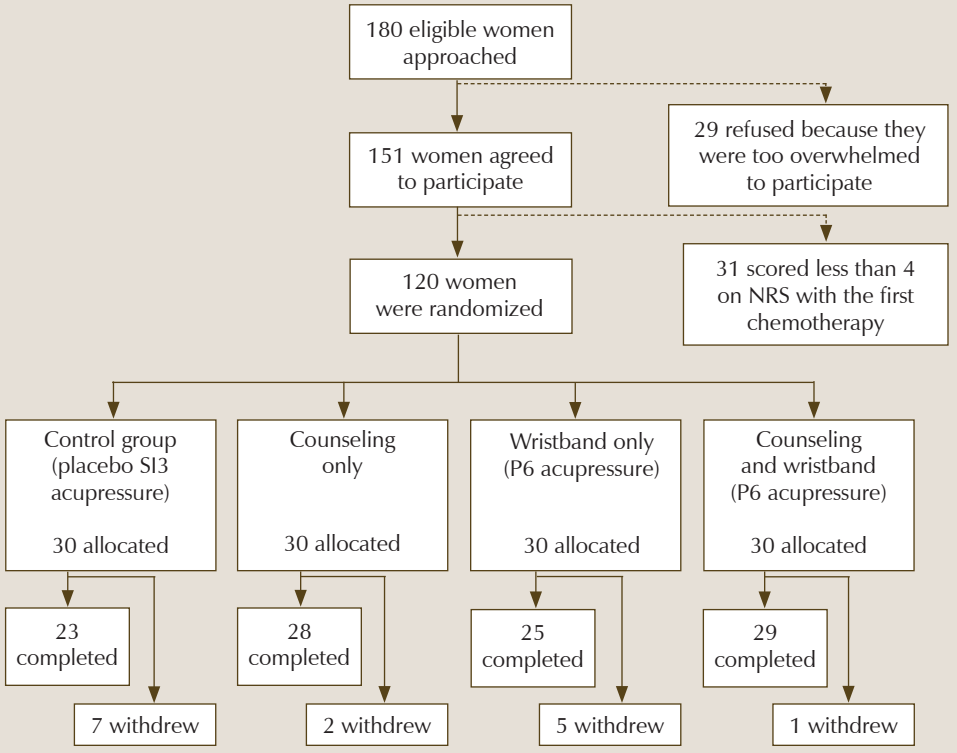
The design for the current study was an RCT using four treatment groups. The participants were assigned randomly to one of four groups: the control group (sham acupressure on SI3 point—the ulnar side of the metacarpophalangeal joint of the little finger of both hands) and three experimental groups (counseling-only, P6 acupressure-only, and P6 acupressure and counseling).

Sample

Patients with breast cancer were recruited from December 2008 to September 2009 in a university cancer center in Seoul, South Korea. Potential participants were informed of the study when they came for chemotherapy education on the first day of adjuvant chemotherapy. Interested individuals were assessed by the study assistant based on the following inclusion criteria: older than 20 years, diagnosed with breast cancer stage I–III, previously received definitive breast surgery, currently undergoing the second cycle of adjuvant chemotherapy with either the FAC (5-fluorouracil, adriamycin, and cyclophosphamide) or ACT (adriamycin, cyclophosphamide, and Taxol® [paclitaxel]) regimen, had more than mild levels of nausea and vomiting with the first cycle of chemotherapy, had no problem communicating in Korean, and willing to participate in the study. Patients with chronic diseases such as diabetes, hypertension, arthritis, or psychiatric diseases or with a history of other types of cancer were not eligible. Given that the effect size of P6 acupressure was considered large in previous studies (Molassiotis et al., 2007), the pretrial power calculation indicated that at least 18

participants per group would be necessary to achieve a power of 80% with an alpha of 0.05. Considering some attrition, 30 participants per group, or 120 participants total, was envisioned as the sample size.

The patients who agreed to participate in the study at the first contact had their level of acute and delayed nausea measured on the fifth day of their first cycle of chemotherapy, and only patients who had an average nausea level of more than four on a numeric rating scale (NRS), ranging from 0 (no nausea) to 10 (worst nausea), were recruited. Of the 180 eligible women who were asked to participate, 29 (16%) women refused. The most common reason for refusal was that they were too overwhelmed to get involved in the research. Of the 151 potential participants who agreed, 31 (21%) were excluded because their nausea levels with first-cycle chemotherapy were less than 4 on the NRS. Therefore, 120 women were randomized into four groups, and 105 women completed the study (see Figure 1). The attrition rate of 13% was not statistically significant by treatment group using a chi-squared independence test ($\chi^2 = 12$, $p = 0.213$).



NRS—numeric rating scale; P6—pericardium 6

Note. Dashed lines indicate patients who were contacted but did not participate in the study.

Figure 1. Participant Progress Through the Study

Procedure

The institutional review board in the College of Nursing at Seoul National University approved the study. The research team consisted of the author and four research assistants who received two training sessions on the study protocol and the interventions. The counseling session, however, was administered only by the author to standardize the quality of the counseling. Written informed consent was signed by the participants as they were approached by the research assistants and agreed to participate. Only patients scoring more than 4 on the NRS for the first cycle of chemotherapy were randomized into one of the four groups when they returned for their second cycle of chemotherapy. Randomization was performed using the table of random sampling digits before the study began and was stored in numbered, sealed, opaque envelopes that were opened by a research assistant as each participant had consented.

The four groups included the control group with SI3 placebo acupressure and the experimental groups with counseling only (treatment group I), with the wristband only (treatment group II), and with the wristband and counseling (treatment group III). Each participant received individual treatment according to the study protocol before the second cycle of chemotherapy. The participants in the control group were guided to place a piece of surgical tape on the ulnar side of the metacarpophalangeal joint of the little finger of both hands (SI3, or the *hou xi* point) (Dibble et al., 2007). The first application was demonstrated by the research assistant, and a roll of 3M™ Micropore Surgical Tape was given to each participant for possible replacement. The participants were taught to press the taped point with the thumb of the opposite hand whenever they felt nauseated over the course of five days. The participants in treatment group I (the counseling-only group) received one-hour counseling with the author in a quiet meeting room in the cancer center. Most patients in that group were accompanied by a family member. The counseling session included an introduction, cognitive preparation, symptom acceptance, the use of available resources, and a question-and-answer session. The participants were guided to practice cognitive preparation, symptom acceptance, and the use of available resources at least once a day for at least five days following. Women in treatment group II (the wristband-only group) were taught how

to apply and keep a Sea-Band® on both hands for five days. Sea-Bands are knitted, elasticized bands that have a 1-cm-round protruding plastic stud inside for continuous acupressure on the P6 point. The wristbands were worn on both wrists, about three fingers down the forearm from the crease of the wrist. For women in treatment group III (the wristband and counseling group), the wristband and the counseling session were applied together.

All participants filled out a baseline data questionnaire, including demographic and disease-specific information, and immediately turned them in. In addition, all women received a booklet of instruments and daily log. They were asked to check their gastrointestinal (GI) distress level nine different times in the evening of the first day of the second chemotherapy injection, and two times (12 hours apart, once in the morning and once in the evening)

Table 1. Demographic and Disease-Related Characteristics of the Participants at Baseline

Characteristic	Control (N = 23)	Treatment Group I (N = 28)	Treatment Group II (N = 25)	Treatment Group III (N = 29)	Total	%	χ^2 or F	p
Age (years) ($\bar{X}$ = 45.35, SD = 8.661)							0.984	0.404
20–29	–	1	–	2	3	3	–	–
30–39	7	7	5	9	28	28	–	–
40–49	8	11	13	12	44	42	–	–
50–59	5	8	6	5	24	23	–	–
60 or older	3	1	1	1	6	6	–	–
Education							1.984	0.121
Elementary school	2	–	–	–	2	2	–	–
Middle school	3	–	1	3	7	7	–	–
High school	6	11	13	8	38	36	–	–
College	12	13	9	15	49	47	–	–
Graduate	–	4	2	3	9	9	–	–
Religion							9.578	0.386
Protestant	7	10	8	7	32	31	–	–
Buddhist	6	7	8	11	32	31	–	–
Catholic	6	8	6	2	22	21	–	–
None	4	3	3	9	19	18	–	–
Marital status							10.862	0.093
Married	21	28	23	22	94	90	–	–
Single	2	–	1	6	9	9	–	–
Divorced or widowed	–	–	1	1	2	2	–	–
Monthly income (U.S. $)							2.797	0.577
Less than 1,000	4	–	3	3	10	10	–	–
1,000–2,000	3	4	2	2	11	11	–	–
2,001–3,000	7	11	7	8	33	31	–	–
3,001–4,000	3	7	6	6	22	21	–	–
More than 4,000	6	6	7	10	29	28	–	–
Breast cancer stage							8.562	0.2
I	4	8	10	3	25	24	–	–
II	14	17	13	21	65	62	–	–
III	5	3	2	5	15	14	–	–
Chemotherapy regimen							1.544	0.67
FAC	11	14	16	16	57	54	–	–
ACT	12	14	9	13	48	46	–	–
Antiemetic medications							8.03	0.783
A	4	6	5	6	21	20	–	–
B	6	11	5	9	31	30	–	–
C	2	1	3	3	9	9	–	–
D	11	9	12	9	41	39	–	–
E	–	1	–	2	3	3	–	–

A—aprepitant only; ACT—adriamycin plus cyclophosphamide plus Taxol®; B—aprepitant plus dexamethasone plus metoclopramide plus famotidine; C—ondansetron plus dexamethasone plus famotidine; D—granisetron plus dexamethasone plus metoclopramide plus famotidine; E—dolasetron plus dexamethasone plus metoclopramide; FAC—5-fluorouracil plus adriamycin plus cyclophosphamide; treatment group I—counseling only; treatment group II—wristband only; treatment group III—counseling and wristband

a day from day 2 to day 5. They were to write a daily log of the antiemetic medication taken and the overall status of their GI symptoms. The research assistants called each participant on the telephone once and sent two text messages during the five days of the intervention period to ensure participants adhered to the assigned interventions and the records. The instrument booklet was collected on the day the women returned to the cancer center for their third cycle of chemotherapy. The day before the next chemotherapy session, the research assistant called each woman to make an appointment to meet the research assistant based on each woman's schedule. For ethical reasons, all women except those in the control group received wristbands and counseling treatment, which they were not provided in the previous cycle, on the day of the third chemotherapy injection.

Table 2. INVR Scores by Time Point in Chemotherapy Cycle

	Day 1		Day 2		Day 3		Day 4		Day 5	
Group	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Control	12.09	9.44	12.39	9.7	12.28	9.62	10.76	7.54	9.17	7.58
Treatment I	10.92	7.27	10.66	6.4	9.46	6.54	7.86	5.5	5.48	4.98
Treatment II	7.29	4.55	6.57	3.41	6.63	4.43	5.48	3.84	3.55	3.66
Treatment III	7.97	5.1	6.5	5.58	4.91	4.46	3.84	4.35	3.12	4.3
Total	9.39	6.88	8.8	6.88	8.07	6.9	6.75	5.88	5.12	5.64

N = 105

INVR—Index of Nausea, Vomiting, and Retching; treatment group I—counseling only; treatment group II—wristband only; treatment group III—counseling and wristband

Note. Higher scores indicate higher levels of nausea, vomiting, and retching.

Intervention

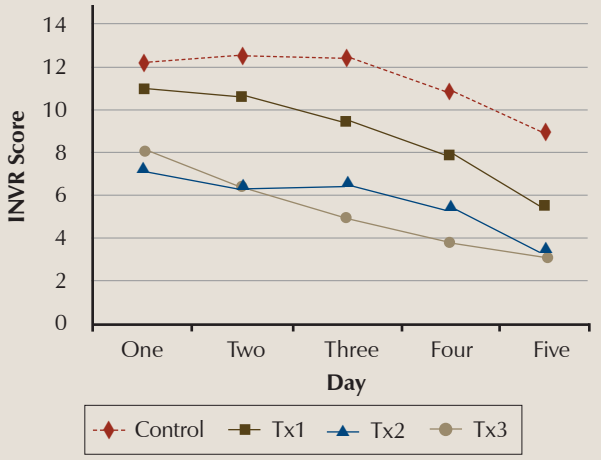
Acupressure at the P6 point and nurse-provided counseling based on cognitive-behavioral therapy were administered in the current study. P6 acupressure was applied using a Sea-Band wristband. Operationalization of P6 acupressure was standardized as such that the participants wore the wristbands bilaterally for five days in a row from the beginning of their second cycle of chemotherapy. Participants were informed that they could remove the bands only for short periods of time when showering to prevent it from getting wet. In case of any numbness or edema in the hands, participants were instructed to remove the bands and report to the author. However, no such side effects were reported.

A counseling session was developed to help participants cognitively prepare and sufficiently cope with anticipated GI distress. From the comprehensive literature review, three sections were composed: cognitive awareness, affective readiness and symptom acceptance, and the use of available resources (Beck, 1995; Dobson, 2001; Graves, Carter, Anderson, & Winett, 2003). In cognitive awareness, participants were informed about the GI symptoms they may anticipate after chemotherapy; the onset, duration, and severity of GI distress; the characteristics of a person who is more susceptible to nausea; and the associated symptoms of nausea and vomiting. Participants then were counseled to prepare effectively for and accept GI distress symptoms as they occurred. The process of accepting reality focused on complying with reality with a lowered mind rather than confronting the symptoms, which is a Korean-specific coping strategy in patients with breast cancer in the literature (Suh, 2008). In the final session, participants were informed about the use of resources to support themselves in managing GI distress, including adherence to scheduled antiemetic medications, diet strategies for preventing nausea, and regular physical activity. Participants were asked to rank the strategies, from most to least applicable, and individualized diet and physical activities to minimize GI distress were planned. The participants were guided to follow the three sessions at least once a day and whenever they felt nauseated, with a brief breathing session at the beginning. That cognitive-behavioral session was to be performed from the first day of the second cycle of chemotherapy for five days.

Measures

The primary outcome variables of the current study, levels of GI distress, were measured by the INVR (Rhodes & McDaniel, 1999; Rhodes, Watson, & Johnson, 1984). The INVR is self-report instrument with eight items, measuring the frequency (three items) and distress (three items) of each of three symptoms (nausea, vomiting, and retching), the duration of nausea (one item), and the amount of vomiting (one item). Each item is presented with a five-point Likert-type scale, ranging from 0 (not at all) to 4 (very severe). The total score ranges from 0–32 by summing each item score. A higher number implies more severe GI distress (Rhodes & McDaniel, 1999).

The English version of the INVR was translated into Korean. To maintain the content validity of each item, a back translation process was performed along with a face validity evaluation by a bilingual expert. The reliabilities of the INVR were reported to be 0.98 by the developer (Rhodes, Watson, Johnson, Madsen, & Beck, 1987), 0.82 in Shin et al. (2004), 0.85–0.95 in Dibble et al. (2007), and 0.93 in the current study. In the current study, the INVR was administered in the evening of day 1 of the chemotherapy cycle to measure the level of acute nausea, vomiting,



INVR—Index of Nausea, Vomiting, and Retching; Tx1—treatment group I, counseling only; Tx2—treatment group II, wristband only; Tx3—treatment group III, counseling and wristband

Figure 2. INVR Changes by Group

and retching. The INVR then was scored twice a day, 12 hours apart, for four more days (from day 2 to day 5 of chemotherapy) for assessing the delayed GI distress level.

A daily log reporting the list of antiemetic medications taken and the severity of GI distress of the day was kept for five days. Demographic information such as age, education level, religion, marital status, and household income level was collected. Disease-related information including the stages, chemotherapy regimen, and prescribed antiemetic medications also were gathered from medical records.

Data Analysis

Descriptive analysis for the continuous variables, as well as frequencies and percentages for the noncontinuous variables, were calculated. To evaluate the between-group differences in demographic and disease-related characteristics at baseline, one-way analysis of variance (ANOVA) for continuous variables and chi-squared analyses for categorical variables were used. As the normality assumption was checked using the Shapiro-Wilk test, the data were positively skewed, so a log transformation was done and 1 was added to each count for treating the zero point (Field, 2009; Munro, 2001). The assumptions of homogeneity of variance and sphericity were assessed using the Levene and Mauchly tests, respectively. Because the sphericity assumption was violated, the Greenhouse-Geisser epsilon correction was performed. A repeated-measures ANOVA was used to evaluate the INVR differences over time and among the treatment groups. Bonferroni corrections were used for pair-wise comparisons between each of the two groups. Significant group differences were analyzed further using contrast tests and separate ANOVA at a certain time point using Gabriel's or the Games-Howell procedure for the post-hoc tests (Field, 2009). To avoid having missing values, the research assistants checked and thoroughly completed the booklet when they met each participant for the final follow up. All analyses were conducted using SPSS®, version 15.0.

Results

Participant Characteristics

Forty-two percent of participants (n = 44) were in their forties, and the average age was 45 years (see Table 1). More than half of participants had at least some college education, claimed a religion, were married at the time of data collection, reported having stage II breast cancer, and received the FAC regimen. The most commonly used antiemetic medications were granisetron (39%), aprepitant plus dexamethasone (30%), aprepitant only (20%), and ondansetron (9%). None of the pretreatment characteristics were statistically significant among the groups.

Effects of Pericardium 6 Acupressure and Counseling

Ninety-two percent and 51% of participants reported acute (day 1) nausea and vomiting, respectively. In addition, 60% of participants reported delayed (day 2 to 5) vomiting and 96% reported delayed nausea. The average and each of the four group's INVR scores gradually decreased from day 1 to 5 (see Table 2 and Figure 2).

The repeated-measures ANOVA with a Greenhouse-Geisser epsilon correction determined that the INVR scores differed to a statistically significant extent between time points across the treatment groups ($F_{2.412, 243.6} = 28.315$, $p < 0.001$) and between groups across the time points ($F_{3, 101} = 4.315$, $p = 0.007$). The significant main effect by the types of intervention revealed a moderate effect size (partial $\eta^2 = 0.114$) (see Table 3). Post-hoc tests

Table 3. Repeated Measures Analysis of Variance for INVR Scores

Source	SS	df	MS	F	p	Partial η^2
Time	6.043	2.412	2.506	28.315	0.000	0.219
Group	6.589	3	2.196	4.315	0.007	0.114
Time x group	1.447	7.236	0.2	2.26	0.029	0.063
Error	21.555	243.6	0.088	–	–	–

df—degrees of freedom; INVR—Index of Nausea, Vomiting, and Retching; MS—mean square; SS—sum of squares

Note. Partial η^2 is an effect size estimate.

Note. Data were reported with the Greenhouse-Geisser epsilon correction.

Table 4. Group Differences in Acute Versus Delayed Nausea and Vomiting

Variable	F[a]	p	Post-Hoc Tests[b] Group	Group	p
Acute nausea	0.117	0.95	–	–	–
Acute vomiting	4.786	0.004	Control	Wristband only	0.018
			Counseling only	Wristband only	0.007
Delayed nausea	3.674	0.015	Control	Counseling and wristband	0.024
Delayed vomiting	8.682	0.000	Control	Wristband only	0.005
			Control	Counseling and wristband	0.009

[a] df = (3, 101)
[b] Only listed significant comparisons at alpha = 0.05

revealed that the between-group differences could be attributed mainly to the difference between the control group and treatment group III, which provided P6 acupressure and nurse-provided counseling (p = 0.01).

Separate ANOVA at each time point revealed that the INVR scores were not significantly different between groups at day 1 (p = 0.555). However, the INVR scores were significantly different on day 2 ($F_{3, 101} = 2.791$, p = 0.044), day 3 ($F_{3, 101} = 3.757$, p = 0.013), day 4 ($F_{3, 101} = 5.791$, p = 0.001), and day 5 ($F_{3, 101} = 4.877$, p = 0.003). Specific contrasts revealed significant counseling effects only on day 4 (p = 0.025) and wristband effects on day 2 to day 5 (p = 0.005, p = 0.002, p = 0.001, p = 0.001, respectively).

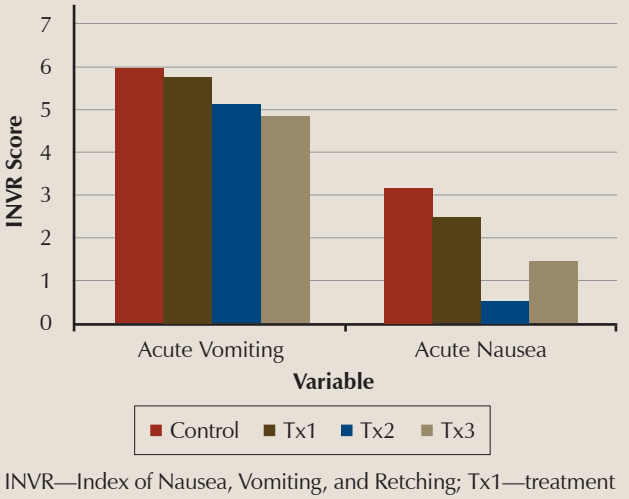
In evaluating the group differences in terms of acute or delayed nausea and vomiting, significant differences existed between groups on acute vomiting, delayed nausea, and delayed vomiting (see Table 4 and Figures 3 and 4). In post-hoc tests of acute vomiting, the wristband-only group was significantly different from the control and counseling-only groups (p = 0.018, p = 0.007, respectively). The control group significantly differed from the group with wristbands and counseling in delayed nausea level (p = 0.024). In terms of delayed vomiting, the group differences were attributed to the differences of the control group from both the wristbands-only group and the group with wristbands and counseling (p = 0.005 and p = 0.009, respectively).

Discussion

The current study is the first RCT evaluating the isolated and combined effects of P6 acupressure and counseling in reducing CINV among non-Western patients. The findings of the study support the use of P6 acupressure and counseling focused on cognitive awareness, affective readiness, symptom acceptance, and the use of available resources as an adjunct to antiemetic medicine for the control of CINV. The combined effect of P6 acupressure and nurse-provided counseling was statistically significant in reducing CINV across the time points. The sole effect of P6 acupressure was evident from day 2 to day 5, whereas the single effect of counseling was significant only on day 4 and close to the significance level (p = 0.053) on day 5. P6 acupressure was more effective in reducing vomiting than nausea, regardless of whether it was acute or delayed, whereas the combined effect of P6 acupressure and counseling controlled delayed GI distress significantly more than acute GI distress. P6 acupressure seems to work directly in reducing vomiting, and counseling shows its effectiveness for delayed GI distress only when used as an adjunct to P6 acupressure.

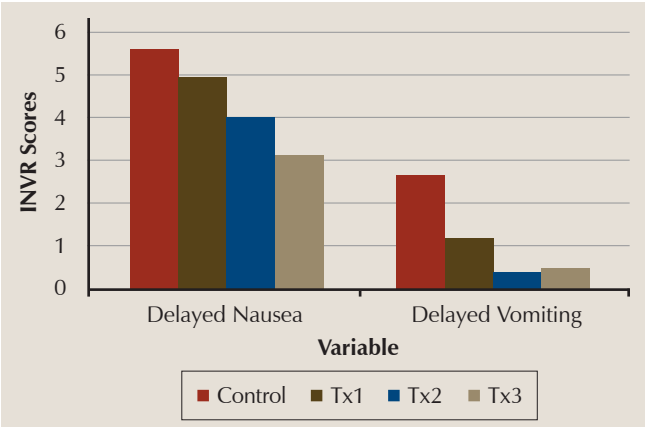
The findings of the current study add positive evidence to previous research that reported the affirmative effects of P6 acupressure on CINV control. The current study, however, has strengths over the previous RCTs with the equivalent intervention and outcome variables: standardizing the application of P6 acupressure, unlike Dibble et al. (2007); having a larger sample size and control of CINV experience after the first chemotherapy injection, unlike Molassiotis et al. (2007); and using a sham control group and more homogeneous participants, unlike Roscoe et al. (2003). In addition, given that the effect size of the intervention was calculated as medium to large and the overall power of the study was 0.94, the current study provides convincing evidence of the effects of P6 acupressure and nurse-provided counseling as nonpharmacologic interventions for CINV control.

The prevalence of CINV in the current study, which was an average of 75%, was similar to those in previous



INVR—Index of Nausea, Vomiting, and Retching; Tx1—treatment group I, counseling only; Tx2—treatment group II, wristband only; Tx3—treatment group III, counseling and wristband

Figure 3. Acute Nausea and Vomiting by Group



INVR—Index of Nausea, Vomiting, and Retching; Tx1—treatment group I, counseling only; Tx2—treatment group II, wristband only; Tx3—treatment group III, counseling and wristband

Figure 4. Delayed Nausea and Vomiting by Group

studies: more than 60% for chemotherapy-induced nausea (Lee et al., 2005), 75% for acute nausea and 98% for delayed nausea experiences (Dibble et al., 2007), and 60% for delayed nausea and 50% for delayed vomiting, even with modern antiemetics (Grunberg et al., 2004). Those comparable reports indicate that CINV is still an unresolved hurdle for patients undergoing chemotherapy despite the use of newly developed antiemetic medications. In the current study, participants were counseled to take all prescribed antiemetic medications and wrote daily logs to validate medication adherence. The high prevalence of CINV, even with the antiemetic medications, underlines not only the fact that the types and doses of antiemetic medications should be more tailored to and closely monitored in each individual, but also that nurse-led nonpharmacologic interventions are necessary for adjunct use.

During the wristband usage training, all of the participants expressed being previously unaware of the P6 point in relation to CINV control, although they were all Korean and familiar with traditional Eastern medicine. Participants' preknowledge and their practices of Eastern medicine did not seem to impact their evaluation of the effectiveness of P6 acupressure. The data of this study, therefore, would be comparable with those of the studies held in Western contexts (Dibble et al., 2007; Molassiotis et al., 2007; Roscoe et al., 2003).

Limitations

The reason why no isolated effect of either counseling or P6 acupressure was found in post-hoc tests of repeated-measures ANOVA was assumed to be because of the relatively small sample size of each treatment group. Collecting data from only women in one cancer center also limits the generalizability of the study findings. Additional research is warranted to overcome those limitations. In addition, the subdimensions of the INVR should be investigated further. The existence of the three CINV subdimensions (i.e., experience, occurrence, and distress) has been controversial. The three dimensions were differentiated in a study by Molassiotis et al. (2007), but only one dimension was identified in a study by Fetzer, Hand, Bouchard, Smith, and Jenkins (2004). In that study, only unidimensional analysis was conducted. Additional research investigating the validity and reliability of the subdimensions of INVR is necessary to increase the accuracy of CINV measurement.

Implications for Nursing

Nurse-provided counseling and P6 acupressure were found to be effective in reducing CINV in patients with breast cancer. In particular, offering P6 acupressure for reducing vomiting, and the combined counseling with P6 acupressure for delayed GI distress, are suggested. Oncology nurses are responsible for closely monitoring medication adherence, tailoring the dose of antiemetics, and administering evidence-proven nursing interventions for CINV control. The findings of the current study expand the body of nursing knowledge by strengthening the evidence of nursing interventions, which are incorporated easily into current practice. Given the complex nature of the CINV experience, a need exists for future research that determines the effects of other kinds of nurse-led interventions and the ways to maximize the effects on CINV control.

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