


Acupressure in the Management of Hyperemesis Gravidarum: A Systematic Analysis

Novida Ariani

Fakultas Kedokteran Universitas Brawijaya Malang

Article Info	ABSTRACT
<p>Keywords: Acupressure, hyperemesis gravidarum, nausea, vomiting, clinical study, experimental study.</p>	<p>Pregnant women who experience more severe emesis gravidarum (nausea and vomiting) are known as hyperemesis gravidarum, this can affect the health of the mother and baby if not treated. To analyze and compile the latest scientific evidence to evaluate the benefits and techniques of acupressure as a method of managing emesis gravidarum, so that it does not develop into hyperemesis gravidarum. This research method is a systematic review with a systematic review based on PRISMA. Literature search based on research articles published in the last 10 years. Literature was obtained from a database of medium to high quality criteria using relevant keywords, namely "acupressure", "hyperemesis gravidarum", "nausea", "vomiting", "clinical study", "experimental study", then selected according to the inclusion and exclusion criteria of the study, appropriate research articles were continued in the PICOT table. Results: Ten studies that passed the inclusion criteria compared 5 different therapies where the most therapy used P6 acupressure and overall were considered to have a low risk of bias. The findings showed that acupressure can reduce the intensity of nausea and vomiting, reduce serum IL-6 levels, lower PUQE scores, better urine ketone results, reduce the frequency of antiemetic administration, and reduce the length of treatment. Therapy Acupressure has the potential to reduce symptoms of nausea and vomiting in pregnancy, especially to prevent the severity towards the diagnosis of Hyperemesis Gravidarum. However, further research with a validated scoring system, diagnostic criteria, clear outcome measures, and conducting larger studies is needed to confirm its effectiveness.</p>
<p>This is an open access article under the CC BY-NC license</p> 	<p>Corresponding Author: Novida Ariani Fakultas Kedokteran Universitas Brawijaya Malang novidaariani@ub.ac.id</p>

INTRODUCTION

Nausea and vomiting in pregnancy or Emesis Gravidarum which is usually called morning sickness affects 70 percent of pregnant women worldwide. However, around 3.6% of pregnant women experience more severe emesis gravidarum known as hyperemesis gravidarum (Feizo et al, 2023). According to the Ministry of Health (2019), the incidence of nausea and vomiting in pregnant women in Indonesia ranges from 50-75% in the first trimester. Meanwhile, those that develop into hyperemesis gravidarum range from 1-3 percent of all pregnancies. Hyperemesis gravidarum is diagnosed based on prolonged symptoms accompanied by weight loss of more than 5% of pre-pregnancy weight,

dehydration, and electrolyte imbalance without any other medical conditions that cause it (Shehmar, 2016). Nausea and vomiting in pregnancy occurs due to changes in the endocrine system that occur during pregnancy, especially the increase in the hormone hCG in pregnancy and is a common complaint of almost 50-80% of pregnant women. Psychologically, nausea and vomiting during pregnancy affects more than 80% of pregnant women and has a significant effect on quality of life. Some pregnant women feel that nausea and vomiting are common during pregnancy. Others feel it as something uncomfortable and disruptive to daily activities (Rofi'ah, 2017).

Hyperemesis gravidarum is defined as a condition that begins in early pregnancy before 16 weeks and is characterized by symptoms of severe nausea or vomiting, inability to eat or drink, and limitations in performing daily activities (Jansen et al, 2021). In addition to affecting maternal health, it can also affect fetal health. Excessive nausea and vomiting during pregnancy can have negative impacts on the fetus such as miscarriage, low birth weight, premature birth, and birth defects. Pregnant women with hyperemesis gravidarum also increase the occurrence of IUGR (intrauterine growth retardation) (Nurmi et al, 2020).

Treatment options for hyperemesis gravidarum include parenteral antiemetic drugs, electrolyte fluids, and supportive nutrition. Interventions will be adjusted based on the frequency and severity of symptoms. Mild emesis gravidarum, with a PUQE score ≤ 6 , does not require specific medical therapy. Moderate emesis gravidarum, with a PUQE score of 7-12, can be given complementary therapy, nutritional therapy, and if there is no improvement, antiemetics can be given. Meanwhile, severe emesis gravidarum with a PUQE score >13 generally requires hospitalization to obtain electrolyte fluids and nutritional therapy. Nutritional modifications such as eating small portions but often, avoiding spicy foods, avoiding foods with strong odors, or foods made from coconut milk and high in oil can relieve symptoms of nausea and vomiting (Boelig et al, 2018). Treatment with neurotransmitter blockages such as dopamine receptor antagonists (metoclopramide) and serotonin 5-HT antagonists (ondansetron) which are often associated with side effects such as drowsiness and extrapyramidal symptoms (Feizo et al, 2019).

Acupressure therapy is a complementary therapy of choice that has the advantages of being non-invasive, easy to apply, cost-effective, and has no significant side effects (Boelig et al, 2018). The application of acupressure to the P6 meridian point (Nei Guan) is known to reduce vomiting and other abdominal complaints in traditional Chinese medicine practice. The P6 acupoint (Nei Guan) is the sixth meridian point in the Hand Jueyin pericardial channel, which is located on the anterior surface of the forearm about 2 inches (5 cm/2 thumbs) proximal-distal to the wrist, between the tendons of the flexor carpi radialis muscle and the palmaris longus muscle (Nafiah et al, 2022). The mechanism of P6 acupressure point to manage nausea and vomiting is still not fully understood. However, the findings explain that acupressure at this point can stimulate the release of β endorphin into the cerebrospinal fluid, thereby increasing endogenous antiemetics so that pressing this P6 point can reduce nausea and vomiting (Ministry of Health, 2019). The effectiveness of P6 acupressure on nausea and vomiting has been proven in various conditions. However, the standardization of therapy still varies for each study. Therefore, this study was conducted to analyze and compile the latest

scientific evidence to evaluate the benefits and effective acupressure points as a method of managing emesis gravidarum, so that it does not develop into hyperemesis gravidarum.

METHOD

The method used in this study is a systematic review, where this study aims to critically and systematically review certain ideas or findings. This systematic review also uses the PRISMA guidelines.

Search Strategy

In this study, researchers examined the effect of acupressure on the management of emesis gravidarum and hyperemesis gravidarum. The data used are secondary data, because researchers did not make direct observations. Data were obtained from the results of research that had been conducted by previous researchers through existing research journals. Journal searches used databases with medium to high quality criteria, namely Pubmed, Science Direct, Google Scholar with relevant keywords such as "acupressure", "hyperemesis gravidarum", "nausea", "vomiting", "clinical studies", "experimental studies". The articles used were research articles published in the last 10 years, namely 2014-2024.

Study Selection

Studies were assessed based on the eligible population for inclusion, namely clinical studies evaluating the effects of acupressure in reducing symptoms of hyperemesis gravidarum in pregnant women. Study participants were pregnant women with a diagnosis of emesis gravidarum and/or hyperemesis gravidarum, either approved by a doctor or through other standard criteria. If there was any doubt about the study population used, a discussion was held within the study group. The targeted intervention was acupressure therapy either carried out by a health professional or independently by the study participants with adequate guidance and monitoring. The intervention was intended to reduce nausea and vomiting. The comparison group received a placebo, received medication or other intervention, or received no treatment. The primary outcomes of interest were a decrease in the frequency of nausea and vomiting, increased tolerance of food or fluids, changes in symptom severity scores, or other outcomes related to the benefits of acupressure use. A systematic review was searched to ensure that all literature obtained was relevant. The search was limited to manuscripts in English and Indonesian. Only full manuscripts published in journals were included. If there were duplicate journals, they were removed or deleted. The authors jointly searched the literature and screened based on the abstract. Studies that meet the inclusion criteria and are in full text form will be used. Studies with non-clinical designs, qualitative studies are automatically excluded.

Data Extraction

Extraction was carried out following a structure determined by the author. The data taken were publication information, study design, study population, number of participants, acupressure points used, study time, measured outcomes, and main findings. The extracted data will be entered into the PICOT table.

RESULTS

Based on the entire literature, 30 articles were identified. A total of 4 studies were excluded because there was duplication, then 5 studies were excluded because they did not meet the requirements by the automation tool, and 11 studies were excluded for other reasons. Furthermore, studies were selected and assessed for their eligibility, no studies failed to meet the inclusion requirements. The results were 10 studies used as references.

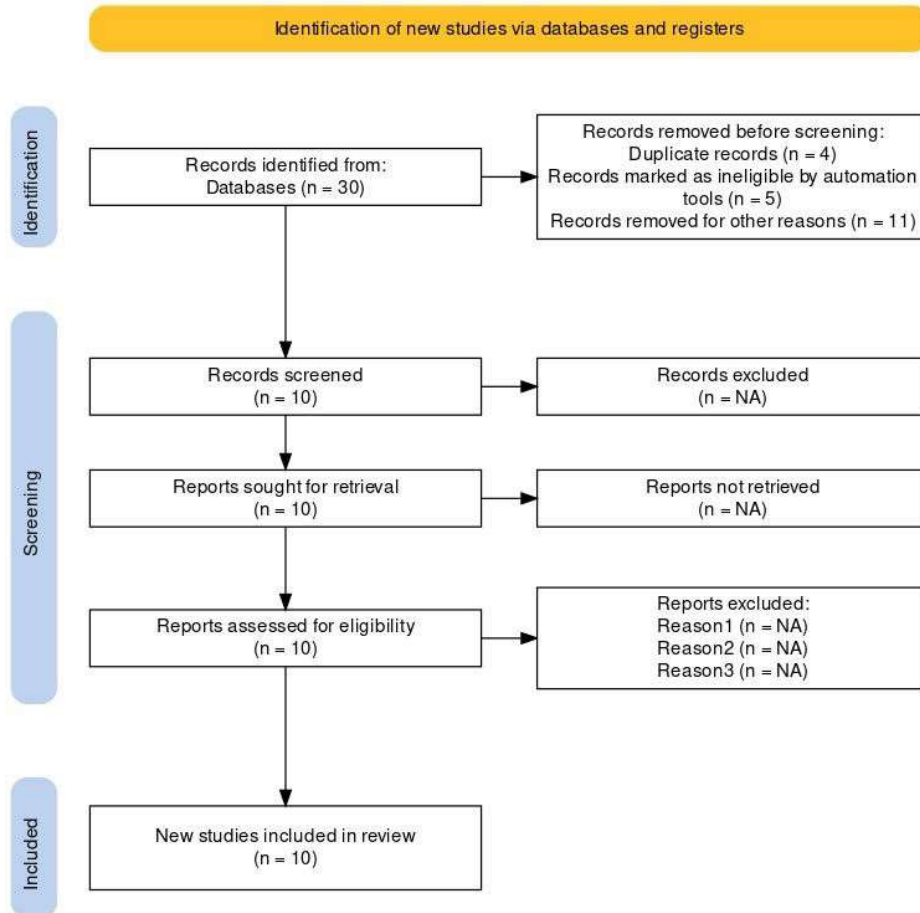


Figure 1. PRISMA diagram

Most studies included participants based on symptoms of nausea and vomiting, and some of them reached the level of hyperemesis gravidarum, ketonuria, and length of hospitalization. Some studies used a scoring system at the time of inclusion: Sari et al., Ria, et al., Tanjung, et al., Tangkas, et al., Yilmaz, et al., Nafiah, et al., and Adlan, et al., used PUQE (Pregnancy-Unique Quantification of Emesis/Nausea). In addition, Zahra, et al used INVR (Index of Nausea, Vomiting and Retching). The average age of participants was 20-35 years, and the average gestational age at inclusion was in the first trimester ranging from 6 to 16 weeks (See Table 1).

Results

Table 1. Summary of Studies

Author/Year/ Design	Patient	Intervention	Control	Outer
Sari, AK., and Setianingsih, 2024 Quasi Experimental	12 pregnant women with gestational age 0-12 weeks were divided into treatment and control groups, each consisting of 6 people who were being treated at the hospital.	The intervention group received acupressure and aromatherapy	There was no special treatment in the control group	The results showed that the combination of acupressure and peppermint aromatherapy significantly reduced the frequency of these symptoms. Statistical analysis using paired t-test produced a p value of 0.012.
Tangkas, M., and Jawi, M., and Wiryana, M., and Budiana, NG., 2022 Quasi Experimental	10 pregnant women with gestational age 6-16 weeks with hyperemesis pregnancy, which is divided into 2 groups.	The intervention group received acupressure stimulation using acuband bracelets on both wrists. The push button for the acupressure bracelet was placed on the PC6 point in 5 patients, the bracelet was worn for 48 hours since the respondent came.	The control group received acupressure at the Sham point. The wristbands were worn for 48 hours from the time the respondents arrived.	Serum IL-6 levels were significantly decreased in patients stimulated at the PC6 point compared to the Sham point ($p < 0.05$).
Rahmanindar, N., and Zulfiana, E., and Harnawati, RA., 2021	50 pregnant women in the first trimester were divided into 2 groups, each consisting of 25	The intervention group received acupressure at point PC6.	The control group was not given any treatment.	The results of the analysis test using Man Whitney showed a p value of 0.000,

Author/Year/ Design	Patient	Intervention	Control	Outer
Quasi Experimental	respondents.			meaning that there is an effect of acupressure massage in reducing nausea and vomiting during pregnancy.
Tanjung, WW., 20 and Wari, Y., and Antoni, A., 2020	pregnant women who visited the PMB midwife	The who interventi group received	This study did not use a control group.	Resultsresearch shows that there is
Quasi Experimental	experienced nausea and vomiting.	pericardial acupressure 6		the effect of acupressure at the Pericardium 6 point on the intensity of nausea and vomiting in pregnant women in the first trimester with a p value of 0.000 (p < 0.05).
Mahmood, H., and Shah, TZ., and Rasool, S., and Waqar, A., and Zia-ul- Miraj, and Maken, ZH., and Gohar, A., and Rauf, A., 2021 Quasi Experimental	96 pregnant women who had diagnostic criteria for hyperemesis were divided into control and treatment groups, each group consisting of 46 people.	The interventi group received <ul style="list-style-type: none"> • Vitamin B6 is added intravenously during rehydration. • Acupressure application is done with 15g each of Amomum Villosum and 	The control group received: <ul style="list-style-type: none"> • KIE for eating light diet and vitamin-rich foods is given to patients. When nausea and vomiting are very serious, good rest and sleep should be considered. • Injection of 	After 7 days of treatment, the effective percentage rate in the experimental group was higher than that in the control group in terms of clinical efficacy. The SAS and SDS scores, time and cost of

Author/Year/ Design	Patient	Intervention	Control	Outer
		<p>sage leaves, ground into powder and made into paste by ginger juice for use.</p> <p>Acupressure on the lower arms on both sides and on the abdomen. Apply ginger paste to the selected acupressure, once a day and maintain for 4 hours, taking 7 days as one cycle of treatment until the patient</p>	<p>5%~10% glucose or Green solution and addition of 2~3g vitamin C, given by intravenous infusion.</p> <ul style="list-style-type: none"> Total daily rehydration is determined by the specific symptoms of the pregnant woman, generally not exceeding 3500ml; according to electrolyte results. Daily potassium supplementati on 3~4g, injection 	<p>antiemetic treatment and hospitalization were significantly lower and within the specified limits in the experimental group compared with the control group.</p>
		<ul style="list-style-type: none"> Psychological treatment, by professional psychotherapists, doctors and nurses of obstetrics and gynecology department participate and adopt a combination of collective 	<p>chloridepotassium 10% as many as 15 ~ 20ml can be given; for those with metabolic acidosis.</p> <ul style="list-style-type: none"> If the blood gas analysis results show that the CO2 binding strength is 	

Author/Year/ Design	Patient	Intervention	Control	Outer
		and individual methods for psychological treatment.	<p><18mmol/L, an appropriate amount can be added with 5% sodium bicarbonate injection.</p> <ul style="list-style-type: none"> For patients with severe dehydration, rehydration should be done quickly, so the amount of fluid replacement should be increased on the first day and then the amount of fluid replacement should be adjusted according to the specific conditions of vomiting and diet of pregnant women. Use of drugs 	
			<p>Antiemetics and sedatives should be discontinued during treatment. Taking 7 days</p>	

Author/Year/ Design	Patient	Intervention	Control	Outer
			as a treatment cycle until the patient is discharged is done.	
Yilmaz, M.P., and Yazıcı, S., and Yilmaz, I., 2023 RCT	74 pregnant women between 6-12 weeks of gestation 14 weeks old with nausea and vomiting who visited the hospital	The experimental and control groups were selected using a simple random method. The experimental group wore acupressure bracelets for one week. Acupressure bracelet applied to pericardium point 6 (PC6) using special pins on elastic bands. Pregnant women were asked to wear the bracelets on both wrists for a week.	The control group did not receive any intervention and was only asked to complete the PUQE test.	Acupressure bracelets decreased nausea and vomiting scores of pregnant women in the experimental group without statistical significance but did not change the nausea and vomiting scores of pregnant women in the control group. The degree of relationship between two variables was evaluated using the Spearman correlation test. Research findings show that there is no evidence of miscarriage due to the use of bracelets during the 6-14 week gestation

Author/Year/ Design	Patient	Intervention	Control	Outer
				<p>period.</p> <p>The characteristics of pregnant women in this study were analyzed, including their age, education level, and number of pregnancies.</p>
				<p>The PUQE scores of the experimental and control groups were compared using statistical tests, showing significant differences between the groups.</p>
Zahra, R., and Nurhasanah, C., and Fitriani, 2024 Quasi Experimental	32 pregnant women were divided into 2 groups	In this study, subjects were divided into two groups, namely the P6 pericardium acupressure group	The control group received ST36 zusanli acupressure.	Data analysis was performed using paired T-test to see the test results before and after P6 and ST36 acupressure, and independent T-test to compare the frequency of nausea in both groups. The

Author/Year/ Design	Patient	Intervention	Control	Outer
				results showed that P6 and ST36 acupressure effectively reduced the frequency of nausea and vomiting before and after treatment, the p value for each group was (0.001 <0.05). The average rating for P6 acupressure was 17.81 and the average rating for ST36 was 15.19. P6 pericardial acupressure is more effective than ST36 acupressure.
Adlan, AS., and	The participants	The intervention	Group	Use
Chooi, KY., and Adenan, NAM., 2017 RCT	were pregnant women with hyperemesis gravidarum. A total of 120 eligible patients were recruited, with 60 patients allocated to each group. This study	that given in this study was acupressure at the Neiguan point (Pericardium P6) using an acupressure band placed on the wrist. This acupressure	The comparator was given a placebo treatment, namely using a wristband without acupressure at the Neiguan point.	acupressure band at Neiguan point (P6) as an additional therapy significantly reduced nausea and vomiting, lower PUQE scores, better

Author/Year/ Design	Patient	Intervention	Control	Outer
	included spontaneously occurring, low-risk singleton pregnancies with a gestational age of 5-14 weeks.	band was worn for 12 hours every day for the first three days of hospitalization. Compliance rates for wearing these acupressure bands are high, with no allergic reactions, itching, or pain reported.		ketonuria levels, and shorter length of hospital stay compared to the control group.
Nafiah, NAM., and Chieng, WK., and Zainuddin, AA., and Chew, KT., and Kalok, A., and Abu, MA., and Ng, BK., and Ismail, NAM., and Azurah, AGN., 2022 RCT	Pregnant women who were hospitalized with a gestational age of ≤ 16 weeks, experienced nausea and vomiting ranging from moderate to severe. with a total sample of 90 people. divided into 2 groups	For the intervention group, participants wore an acupressure bracelet with a button on the bracelet that applied pressure precisely to the P6 (Nei Guan) point. The bracelet was worn on the left and right arms simultaneously, three times a day for at least 10 minutes before breakfast, lunch, and dinner. Participants were instructed to correctly determine the P6 point and were observed when	for the control group, intravenous fluids were given according to hospital protocol, and regular intravenous metoclopramide 10 mg was given. every 8 hours for 24 hours.	There was a statistically significant difference in the rate of nausea and vomiting between the two groups at 8, 16, and 24 hours after hospital admission (p8h= 0.001, p16h = 0.006, and p24h = 0.001). The need for antiemetics and urinary ketone clearance rates between the two groups were also statistically significant, with p = 0.001 and p = 0.02,

Author/Year/ Design	Patient	Intervention	Control	Outer
		they first wore the bracelet. The intervention was conducted for only one day during		respectively. There were no adverse effects in either group. P6 cupressure is effective in relieving nausea
		participants are treated in hospital. Intravenous fluids given accordingly home protocol sick, and antiemetic reserve, metoclopramide intravenously 10 mg, given if vomiting no reduce.		and vomit in between women with yperemesis pregnancy.
Ria, MB., and Manek BD., 2022 Quasi Experimental	40 pregnant women trimester 1 is divided into 4 groups each consisting of 10 people	group 1 (PC-6 acupressure), group 2 (SP-3 acupressure), group 3 (combination of PC-6 and SP-3 acupressure),	control group received vitamin B6	Afteracupressu re intervention at point PC-6, point SP-3, or a combination of both, the frequency of vomiting and nausea as well as the duration of nausea were reduced.

Benefits of Acupressure

There are 4 quasi-experimental studies that prove that acupressure can reduce the intensity of nausea, namely studies by Sari and Setianingsih (2024), Rahmanindar, et al. (2021), Tanjung, et al. (2020), and Yılmaz, et al. (2023). An RCT study (Mahmood, et al., 2021), further stated that acupressure was significantly effective in reducing nausea,

vomiting, weakness, dizziness, anxiety, emesis, frequency of antiemesis administration, and duration of treatment. There is a study (Tangkas, et al., 2022) that also measured the effect of acupressure on reducing serum IL6 levels. It was found that not only did acupressure have a significant effect on reducing the intensity of nausea, vomiting, but also on reducing serum IL6 levels.

One study (Nafiah, et al., 2022) further proved that acupressure was proven to significantly reduce nausea and vomiting, accelerate the duration of urinary ketone reduction, and reduce the frequency of antiemetic administration. Another RCT study (Adlan, et al., 2017) also supports the research of Nafiah, et al., 2022. It was found that acupressure significantly reduced nausea and vomiting and urinary ketones.

There are also two quasi-experimental studies that compare the effectiveness between two acupressure points. Research by Ria, et al. (2022), states that acupressure treatment of the acupressure points PC6, SP3 acupressure, and a combination of PC6 and SP3 acupressure have been shown to significantly reduce nausea and vomiting. However, SP3 acupressure is more effective in reducing the duration of nausea and the frequency of vomiting. Meanwhile, PC6 acupressure is more effective in reducing the frequency of nausea. The second is a study by Zahra, et al. (2024). The results of the study showed that P6 and ST36 acupressure both had a significant effect on reducing the intensity of nausea and vomiting. However, P6 is more effective than ST36.

Acupressure Points

Ten studies consisting of seven studies with quasi-experimental designs (Mahmood, H., et al 2021; Rahmanindar, N., et al 2021; Ria., et al., 2022; Sari., et al, 2024; Tangkas, M. et al 2022; Tanjung., et al 2020; Zahra, R., et al 2024) and three RCT studies (Adlan, et al 2017; Nafiah, et al 2022; Yilmaz, et al 2023) proved that the Nei Guan or Pericardium 6 (P6 or PC 6) point is useful in relieving nausea and vomiting in pregnancy. In addition to the P6 or PC 6 point, there are two quasi-experimental studies comparing the effectiveness between two other acupressure points. One of them is the PC6 point vs SP3 point (Ria, et al., 2022), and the P6 point vs ST36 point (Zahra, et al., 2024). The benefits are explained in the benefits column.

Discussion

The 10 studies compared 5 different therapies (most using P6 acupressure), and were overall considered to have a low risk of bias. The main finding was the lack of in-depth research on the treatment of nausea and vomiting, and its severe form, hyperemesis gravidarum. Acupressure showed a significant effect on reducing nausea and vomiting.

There were three studies with sample sizes of less than 30. And, only four had respondents with hyperemesis gravidarum, the rest used respondents with nausea and vomiting who were treated in health facilities. One study (Mahmood, et al.) ensured that their respondents met the criteria for hyperemesis gravidarum as stated in the book "Obstetrics and Gynecology" (5th edition). Furthermore, the studies in this review used several tools to measure symptoms. As a result, it is difficult to synthesize data and compare results between studies.

This review included 10 previous studies. Strengths include the use of well-defined tools for assessing risk of bias. Furthermore, the search strategy was developed in collaboration with information specialists. In addition, all authors independently screened and checked abstracts, full texts, and extracted data.

In general, the results of this review indicate that there are previous studies evaluating the effects of treatment for nausea and vomiting and hyperemesis gravidarum. Acupressure shows the possibility of reducing the intensity of nausea and vomiting, reducing weakness, dizziness, anxiety and depression (combined with psychological therapy), reducing serum IL-6 levels, accelerating the duration of urinary ketone reduction, reducing the frequency of antiemetic administration, and reducing the duration of treatment. These results can be used as a basis for further and stronger research, in various countries to obtain a comprehensive number of patients. In addition, studies can be continued using a validated scoring system, establishing diagnostic criteria, and clear descriptions and measurements of core outcomes.

This body of research requires a shorter version that includes more detailed definitions of outcomes and how to measure them. This study could formulate a core set of measures, which would lead to more standardized reporting in future trials, allowing for meta-analyses. Standard care in health care settings for women with nausea and vomiting is fluid replacement therapy with intravenous fluids. This is likely to save money for the health care system. Additional studies on outpatient vs. inpatient care may be warranted in the future. Future research has a better chance than previous research for several reasons. From this study, an idea of the desired outcome is obtained in the future. This will allow meta-analysis, and draw stronger conclusions about the treatment of nausea and vomiting and its severe form, hyperemesis gravidarum.

CONCLUSION

Acupressure is a therapy that shows the possibility of reducing the intensity of nausea and vomiting, reducing weakness, dizziness, anxiety and depression (combined with psychological therapy), reducing serum IL-6 levels, accelerating the duration of urinary ketone reduction, reducing the frequency of antiemetic administration, and reducing the duration of treatment. However, the lack of studies does not allow further conclusions. To obtain stronger evidence, it is important to use a validated scoring system, diagnostic criteria, clear descriptions and measurements of core outcomes, and conduct larger studies (large number of respondents, and from various countries).

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