II. Quantitative Research

Assessing the Quality of Randomized Controlled Trials in Acupressure for Women Health

A Systematic Review

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Abstract

Background

The general application of the "Qi" practice though acupressure and cupping in orthodontic medicine of women health is hampered by the lacking of evidence in the efficacy. Although there are increasing clinical trials on this filed, the quality on the design, implementation, and reporting is barely addressed.

Material and Methods

A scoring system based on the guideline of Consolidated Standards of Reporting Trials (CONSORT) updated in 2010 first developed. Literatures on applying the acupressure and cupping for women health using a randomized controlled study design (RCT) were reviewed by the authors to ensure the relevance for the context of the study aim. The authors were trained and calibrated in the standard of scoring for each item. The total score and that normalized by the full score for each item and study were used to assess the absolute and relative quality, respectively.

Results

Among the 76 article searched from PubMed using the keyword of "acupressure" and "randomized controlled trial", 13 of them were enrolled. Among the full total score of 66, the average score for the 13 articles was 39.8 (SD: 10.2) and the normalized rank was 60%.

The score for the category of "Title and Abstract", "Study design", "Study implementation", "Results", and "Discussion" was 5.5 (SD: 1.7, rank:69%), 10.0 (SD: 1.9, rank: 83%), 7.2 (SD: 3.6, rank: 45%), 9.7 (SD: 3.9, rank: 54%), and 6.6 (SD: 2.4, rank: 55%), respectively.

Conclusion

The quality of the study on evaluating acupressure in the field of women health using RCT is modest with the rank reaching 60% of the requirement of CONSORT standard. The main drawback was in the category of "Study Implementation", which calls for improvement in conducting further study.

Keywords: Quantitative research, Systematic review, Randomized controlled study, CONSORT

Introduction

The efficacy of the "Qi" practice through maneuvers such as acupressure in improving functionality and reducing disease symptoms have gained great attention in recent years (Au et al., 2015; Ernst et al., 2010). Due to the minimal risk of adverse effect compared with the use of chemicals such as pain control medications, anti-emetics, and sedatives, the applications of acupressure in the field of women health, especially for the treatment of dysmenorrhea and discomfort during labor including pain, nausea and vomit, and prolonged headache due to epidural procedures are of great interest. Considering the treatment of dysmenorrhea, the conventional approach in the field of orthodontic medicine including endocrinology and gynecological assessment to rule out the disease incurred by organic disease such as endometriosis. For subjects with primary dysmenorrhea the mainstay of treatment is pain control and hormonal therapy (Osayande et al., 2014; Wallace et al., 2010). However, the chronicity and periodical discomfort induces by dysmenorrhea is often a concern when these medication therapies are provided to women. The treatment for women with the symptoms associated with pregnancy and labor is also faced with safety considerations (Wallis et al., 2012; Ebrahimi et al., 2010; Caton et al., 2002).

Although the reported efficacy is satisfactory compared with the minimal risk of adverse effect, the main criticism in generalization and wide application of these maneuvers to clinical practice is that there is a lacking of evidence basis. Facing with such criticism, there are also studies tempting to assess the efficacy of acupressure following the principle of evidence based medicine with the randomized controlled study design (RCT). However, the quality of these studies in terms of the standards of reporting RCT, namely CONSORT checklist (Schulz et al., 2010), was not systematically evaluated.

To have a better understanding on the current evidences on efficacy of applying acupressure for the issue of women health, we thus performed a systematic review to summarized the findings and also the process of reaching the results. In this study, we further aimed to quantify and

assess the extent of adherence to scientific principle for current evidences using a CONSORT-based scoring system.

Material and Methods

Systematic review for randomized controlled trial on the efficacy of acupressure on women health The systematic review was conducted by searching the published articles from PubMed with the searching keywords of "acupressure", clinical trial of article types, and free full text in English until June, 2018. The flowchart of retrieving literature is illustrated in Figure 1. Two authors (HHJ and SMP) independently searched the articles with the same strategy. The final decision of study selection was further reviewed by LCH to confirm the relevancy of the study topic of acupressure and women health. There were 13 articles related to gynecological health for evaluating the efficacy of acupressure and six authors (HHJ, SMP, MSK, TYL, WRC, and WCW) independently retrieved data and evaluated the quality of evidence by scoring system with CONSORT checklist (Schulz et al., 2010) elaborated as follows.

Development of scoring system assessing the quality of reporting randomized controlled trial Since all of these studies are randomized controlled trial (RCT), the quality of reporting was assessed by using a scoring system derived from the CONSORT checklist guideline. A three-point scoring system was developed ranged from 0,1, and 2 representing the quality of "not addressed", "addressed but with compromised quality", and "fully addressed" for each item. Following the updated version of CONSORT checklist proposed in 2001 (Moher et al.), a total of 33 items depicting the necessary structure of reporting a randomized controlled trial including abstract, introduction, material and methods, results, and discussion was used as the backbone of the development of the scoring system for assessing the quality of collected studies.

For the study with irrelevant item, a note of "not applicable" was filled. Excluding those not applicable items, it remains 33 items on average, so the total score is 66. For the purpose of calibrating the standard of scoring among the evaluators and validating the feasibility of using the scoring system on acupressure studies, an article published by LCH (Hsieh et al., 2006) was used as standard material before the evaluation of collected literatures.

Results

Literatures on acupressure and women health

Among these 13 articles, one conducted by Pouresmail et al. (2002) was to assess the efficacy of acupressure and Ibuprofen on primary dysmenorrhea and shown there were no difference between this two interventions, but both could reduce pain grade in comparison with sham acupressure (placebo); one conducted by Kashefi et al. (2011) was shown acupressure had more efficient to women general health than sham acupressure (placebo); and others were to explore the efficacy of acupressure for pregnant women before/after childbirth and shown acupressure could reduce morning sickness, nausea or vomiting, the intensity of pain, the

length of labor stages, the labor duration and so on and also increase the infants' Apgar scores (sTable 1).

Quality of reporting the efficacy of acupressure on women health

After scoring each studies to evaluate the quality of evidence with CONSORT checklist guideline, the mean of total score is 39.8 (range: 16-53; SD=10.2) and the mean of score are 5.5 (range: 4-8; SD=1.7), 10.0 (range: 7-12; SD=1.9), 7.2 (range: 2-14; SD=3.6), 9.7 (range: 6-15; SD=3.9), and 6.6 (range: 2-10; SD=2.4) in the "Title and Abstract", "Study design" (including trial design, participants, interventions, outcomes, and sample size), "Study implementation" (including randomisation, blinding, and statistical methods), "Results", and "Discussion", separately (Table 1). The most discrepancy was in the "Study implementation" and "Results".

For the studies related to the efficacy of acupressure associated with women health and labor, the complete statement was in the "Study design" and "Results", and most studies did not mention about the "Randomisation" in the "Methods" section (including sequence generation, allocation concealment mechanism, and Implementation) (Table 2). The study with minimum score was conducted by Pouresmail et al. (2002), and only specified clearly in the "Introduction" section. The other study with maximum score was conducted by MafetoniI RR et al. (2016), the only weakness is in the "Discussion" especially for the information on registration, available protocol, and funding. In addition, it can be observed that the articles published in the recent years had higher score, and those published before 2014 tended to not identify as a RCT in the title.

In Figure 2, the study published by LCH (Hsieh et al., 2006) using as benchmark got 91% of normalized quality score and other studies related to women health and labor had 60% of normalized quality score. The score in each section is 69% (5.5/8) in the "Abstract" section, 83% (10/12) in the "Study design", 45% (7.2/16) in the "Study implementation", 54% (9.7/18) in the "Results", and 55% (6.6/12) in the "Discussion".

Discussion

By using a scoring system with the CONSORT checklist underpinning, we assessed and quantified the quality of current evidences on the efficacy of acupressure for women health following the guideline of scientific principle. Among the 13 enrolled articles using the randomized controlled study design, an overall rank of 60% (39.8/66) was observed, showing a compromised result for current published article in this field. There is also a remarkable variation across studies with the standard deviation estimated as 10.2 for the overall score. Considering the scores of the aspect of "Title and Abstract", "Study Design", "Study Implementation", "Results", and "Discussion", the lowest rank was the "Study Implementation" (45% (7.2/16)), followed by the "Results" (54%, (9.7/18)) and "Discussion" (55%, (6.6/12)). The low rank in these three aspect demonstrating the aspect required for improvement in con-

ducting and reporting a randomized controlled study for providing the evidence on the efficacy of acupressure with scientific background.

Our research focused on the application of acupressure for women health with randomized controlled trial study design. Given the increased attention on gathering scientific evidence for the Qi-based practice such as acupressure and its potential application on personalized medicine, the proposed scoring system can be extended to other study type such as observational study and include a wide range of research topic to be used as a first step for evidence synthesis.

Reference

Abadi, F., Shahabinejad, M., Abadi, F., & Kazemi, M., 2017. "Effect of Acupressure on Symptoms of Postoperative Ileus After Cesarean Section." *Journal of Acupuncture and Meridian Studies*, 10(2), 114-119.

Akbarzadeh, M., Masoudi, Z., Hadianfard, M. J., Kasraeian, M., & Zare, N., 2014. "Comparison of the Effects of Maternal Supportive Care and Acupressure (BL32 acupoint) on Pregnant Women's Pain Intensity and Delivery Outcome." *Journal of Pregnancy*.

Akbarzadeh, M., Masoudi, Z., Zare, N., & Kasraeian, M., 2016. "Comparison of the Effects of Maternal Supportive Care and Acupressure (at BL32 Acupoint) on Labor Length and Infant's Apgar Score." *Global Journal of Health Science*, 8(3), 236.

Au DW, Tsang HW, Ling PP, Leung CH, Ip PK, Cheung WM., 2015 Oct. "Effects of Acupressure on Anxiety: A Systematic Review and Meta-analysis." *Acupunct Med.* 33(5):353-9.

Batool, T., Shahin-Dokht, N. R., Shahnaz, R., & Azizollah, A., 2015. "Evaluation Effect of Shiatsu Technique on Labor Induction in Post-term Pregnancy." *Global Journal of Health Science*, 7(3), 177.

Caton D, Corry MP, Frigoletto FD, Hopkins DP, Lieberman E, Mayberry L, Rooks JP, Rosenfield A, Sakala C, Simkin P, Young D., 2002 May. "The nature and management of labor pain: executive summary." *Am J Obstet Gynecol.* 186(5 Suppl Nature):S1-15. Review.

Dundee, J. W., Sourial, F. B. R., Ghaly, R. G., & Bell, P. F., 1988. "P6 Acupressure Reduces Morning Sickness." *Journal of the Royal Society of Medicine*. 81(8), 456-457.

Ebrahimi N, Maltepe C, Einarson A., 2010 Aug. "Optimal Management of Nausea and Vomiting of Pregnancy." *Int J Womens Health.* 4;2:241-8.

Ernst E, Lee MS. 2010 Oct. "Acupressure: An Overview of Systematic Reviews." *J Pain Symptom Manage*. 40(4):e3-7.

Harmon, D., Ryan, M., Kelly, A., & Bowen, M., 2000. "Acupressure and Prevention of Nausea and Vomiting During and After Spinal Anaesthesia for Caesarean Section." *British Journal of Anaesthesia*. 84(4), 463-467.

Hsieh, L. L. C., Kuo, C. H., Lee, L. H., Yen, A. M. F., Chien, K. L., & Chen, T. H. H., 2006. "Treatment of Low Back Pain by Acupressure and Physical Therapy: Randomised Controlled Trial." *Bmj*. 332(7543), 696-700.

Kashefi, F., Khajehei, M., Ashraf, A. R., & Jafari, P., 2011. "The efficacy of acupressure at the Sanyinjiao point in the improvement of women's general health." *The Journal of Alternative and Complementary Medicine*. 17(12), 1141-1147.

Mafetoni, R. R., & Shimo, A. K. K., 2015. "Effects of Acupressure on Progress of Labor and Cesarean Section Rate: Randomized Clinical Trial." *Revista de saude publica*. 49, 9.

Mafetoni, R. R., & Shimo, A. K. K., 2016. "The Effects of Acupressure on Labor Pains During Child Birth: Randomized Clinical Trial." *Revista latino-americana de enfermagem*. 24.

Levett, K. M., Smith, C. A., Bensoussan, A., & Dahlen, H. G., 2016. "Complementary therapies for labour and birth study: a randomised controlled trial of antenatal integrative medicine for pain management in labour." *BMJ open*. 6(7), e010691.

Moher, D., Schulz, K. F., Altman, D. G., & Consort Group., 2001. The CONSORT Statement: Revised Recommendations for Improving the

Quality of Reports of Parallel-group Randomised Trials.
Noroozinia, H., Mahoori, A., Hasani, E., Gerami-Fahim, M., & Sepehrvand, N., 2013. "The effect of acupressure on nausea and vomiting after cesarean section under spinal anesthesia." *Acta Medica Iranica.* 51(3), 163-167.
Osayande AS, Mehulic S, 2014. "Diagnosis and initial management of dysmenorrhea." *Am Fam Physician.* 89(5):341-6. Review.
Pouresmail, Z., & Ibrahimzadeh, R., 2002. Effects of Acupressure and Ibuprofen on the Severity of Primary Dysmenorrhea." *Journal of Traditional Chinese Medicine*. 22(3), 205-210.
Schulz, K. F., Altman, D. G., & Moher, D., 2010. CONSORT 2010 Statement: Updated Guidelines for Reporting Parallel Group Randomised Trials." *BMC Medicine*. 8(1), 18.
Steele, N. M., French, J., Gatherer-Boyl es, J., N ewman, S., & Leclaire, S., 2001. "Effect of A cupressure by Sea - Bands on Nausea and Vomiting of Pregnancy." *Journal of Obstetric, Gynecologic, & Neonatal Nursing*. 30(1), 61-70.
Wallace S, Keightley A, Gie C. Dysmenorrhoea, 2010. The Obstetrician & Gynaecologist,12:149–154.
Wallis L., 2012. "Effectiveness of Nondrug Pain Relief During Labor." *Am J Nurs.*112(6):15.

緬梔花(Frangipani)別名雞蛋花

西元 1645 年由荷蘭人引進台灣，為常見的盆栽作物，花期晚春至秋末。中醫認為有藥用價值；具豐富乳汁，有毒，外敷可醫治疥瘡、紅腫等症，但誤服可導致嘔吐、惡心、發燒、腹瀉、心跳加速、嘴唇紅腫。

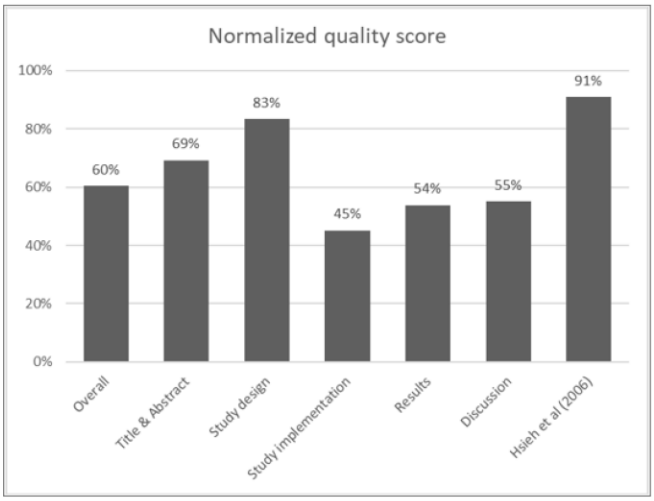

Figure 1. Flowchart of retrieving literature

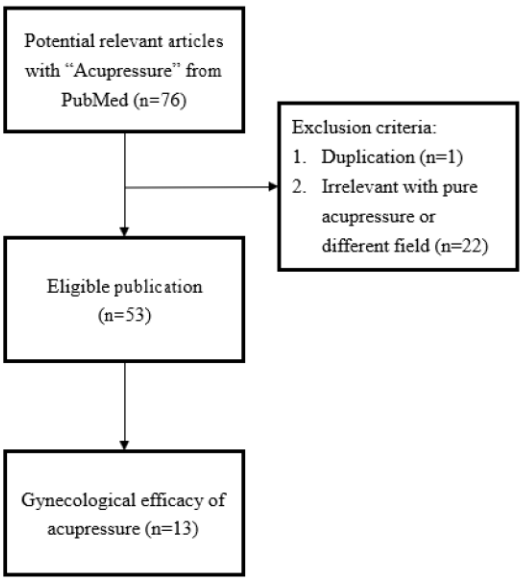

Figure 2. Normalized quality score by sections

Table 1. Summary Results of Scoring System with CONSORT Checklist

Study	Items (total score)					
	Overall	Title & Abstract	Study design	Study Implantation	Results	Discussion
	(66)	(8)	(12)	(16)	(18)	(12)
1988, Dundee et al	38	4	9	3	7	5
2000, Harmon et al	43	4	12	7	14	6
2001, Steele et al	35	6	7	6	9	7
2002, Pouresmail et al	16	4	7	2	1	2
2011, Kashefi et al	49	6	11	9	13	10
2013, Noroozinia et al	31	4	7	7	9	4
2014, Akbarzadeh et al	34	4	11	4	7	8
2015, Batool et al	40	6	10	6	9	9
2015, MafetoniI et al	42	8	11	6	11	6
2016, Akbarzadeh et al	35	6	11	6	6	6
2016, Levett et al	52	8	11	12	13	8
2016, MafetoniI et al	53	8	11	14	15	5
2017, Abadi et al	50	4	12	12	12	10
Mean	39.8	5.5	10.0	7.2	9.7	6.6
SD	10.2	1.7	1.9	3.6	3.9	2.4

Study design : Trial design, participants, interventions, outcomes, and sample size

Study Implementation : Randomisation, blinding, and statistical methods

Table 2. CONSORT Checklist-based Scores in each items

Check-list Items	1988, Dundee et al	2000, Harmon et al	2001, Steele et al	2002, Pouresmail et al	2011, Kashefi et al	2013, Noroozinia et al	2014, Akbarzadeh et al	2015, Batool et al	2015, MafetoniI et al	2016, Akbarzadeh M et al	2016, Levett et al	2016, MafetoniI et al	2017, Abadi et al
1a	0	0	0	0	0	0	0	0	2	0	2	2	0
1b	0	0	2	0	2	0	0	2	2	2	2	2	0
2a	2	2	2	2	2	2	2	2	2	2	2	2	2
2b	2	2	2	2	2	2	2	2	2	2	2	2	2
3a	2	2	0	1	1	1	1	1	1	1	1	1	2
3b	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4a	1	2	2	2	2	2	2	2	2	2	2	2	2
4b	2	2	2	0	2	0	2	2	2	2	2	2	2
5	2	2	1	2	2	2	2	2	2	2	2	2	2
6a	2	2	2	2	2	2	2	2	2	2	2	2	2
6b	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7a	0	2	0	0	2	0	2	1	2	2	2	2	2
7b	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8a	0	0	2	0	0	0	0	2	0	2	2	2	2
8b	0	0	0	0	1	0	0	0	0	0	1	2	2
9	0	0	0	0	2	0	0	0	0	0	2	2	2
10	0	0	0	0	0	0	0	0	0	0	1	0	2
11a	1	1	0	0	0	1	0	0	2	0	2	2	2
11b	.	2	2	2	2	2	2	2	2	2	2	2	0
12a	2	2	2	NA	2	2	2	2	2	2	2	2	2
12b	NA	2	NA	NA	2	2	NA	NA	NA	NA	NA	2	NA
13a	2	2	2	0	2	2	2	2	2	1	2	2	2
13b	1	2	2	0	2	NA	NA	0	2	NA	2	2	2
14a	0	0	0	0	0	2	1	1	1	1	2	2	2
14b	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	1	2	2	0	0	0	0	2	2	0	2	2	2
16	1	1	2	0	2	2	2	2	2	2	2	2	2
17a	0	2	1	1	2	1	1	1	1	1	2	1	2
17b	0	2	0	0	1	1	1	1	1	1	1	2	NA
18	NA	1	NA	NA	2	1	NA	NA	NA	NA	NA	2	NA
19	2	2	0	0	2	0	0	0	0	0	0	NA	NA
20	2	2	2	0	2	0	0	1	2	0	2	2	2
21	1	2	2	0	2	2	0	2	0	0	0	1	2
22	2	2	1	2	2	2	2	2	2	2	2	2	2
23	0	0	0	0	0	0	2	0	2	2	2	0	2
24	0	0	0	0	2	0	2	2	0	0	0	0	0
25	0	0	2	0	2	0	2	2	0	2	2	0	2
Total	38	43	35	16	49	31	34	40	42	35	52	53	50

* NA is a "not applicable item" which is not scored.

sTable 1. Summary table for collected literatures of RCT on the efficacy of acupressure for women health

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
Dundee et al (1988)	Patients attending the antenatal clinic at the Royal Maternity Hospital, Belfast	Randomized clinical trial	(1) Acupressure at P6 point, n=119 (2) Acupressure at a dummy point, n=112 (3) control group (no acupressure), n=119	(1) A highly significant (P<0.0005) difference between the severity of sickness in the control group and those having P6 acupressure (2) A significant (P<0.01) difference between the controls and the dummy acupressure series (3) Sickness was significantly less severe in patients practicing P6 acupressure than in those using a dummy point (P<0.0005).
Harmon et al (2000)	Patients, ASA I, aged between 18 and 40 yr scheduled for elective Caesarean section were recruited. **Exclusion criteria**: previous history of PONV or nausea and vomiting in the preceding 24 hrs, obesity, diabetes mellitus or previous experience of acupuncture or acupressure	Double-blind randomized clinical trial	(1) acupressure at the P6 point (on the anterior surface of the forearm between the tendons of flexor carpi radialis and palmaris longus, 2 'cun' from the distal wrist crease), n=47 (2) control : a point on the dorsal side of the right forearm, proximal to the distal wrist crease, n=47	(1) the use of acupressure reduced incidence of nausea or vomiting from 53%(25/47) to 23%(11/47) compared with placebo (95% confidence interval (CI) 0.34–0.25; P 0.002) during the operation (2) the use of acupressure reduced incidence of nausea or vomiting from 66%(31/47) to 36%(17/47) compared with placebo (95% CI 0.34–0.19; P 0.003) after the operation

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
Steele et al (2001)	A convenience sample of pregnant women in their 1st trimester was recruited on a voluntary basis in 17 obstetric/gynecology offices and clinics in southern Michigan. Criteria for participation were (a) self-report of one or more episodes of pregnancy-related nausea and/or vomiting (b) less than 13 weeks pregnant (c) able to read and speak English	Quasi-experimental design (posttest-only and posttest-repeated measure)	(1) intervention : applied Sea-Bands with acupressure buttons, n=68 (2) control : applied the Sea-Bands without acupressure buttons, n=42	(1) The treatment group had significantly less frequency and severity of nausea and vomiting of pregnancy while wearing the Sea-Bands than did the placebo group. (2) The treatment group also had significantly less frequency and severity of nausea.

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
				1. Significant differences before and after treatment in all the three groups (P<0.01) 2. After the therapy, the severity of primary dysmenorrhea was reduced to grade 0 in 50% of the participants in the acupressure group, 36.1% in the Ibuprofen group, and 18.1% in the placebo group. 3. Before the therapy, the severity of primary
Pouresmail et al (2002)	216 female high school students Inclusion: aged between 14 to 18 yrs, had regular menstruation with dysmenorrhea in all cyclesm pain being experienced 24 hours before or during menstruation bleeding and relieved 72 hours later, single and virgin, experiencing menarche for at least one year, and did not have any special diet, with no established gastrointestinal, renal, hepatic, respiratory or hematological disorders, and any hormonal drugs specially OCOs were not used and no severe sensitivity to NSAIDs	Randomized clinical trial	1. Acupressure 2. Ibuprofen 3. sham acupressure (placebo)	dysmenorrhea at grade III was 38.9% in the acupressure group, 56.9% in the Ibuprofen group, and 38.9% in the placebo group. And after the therapy, none of the participants had such grade of severity in the acupressure group, and 1.4% in the Ibuprofen group, and 18.1% in the placebo group. 4. There were significant statistical differences among them (P=0.0237), but no significant differences between the acupressure and Ibuprofen groups before and after the therapy.

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
Kashefi et al (2011)	86 university students Inclusive criteria : (1) having regular menstrual cycles (3–8 days of menstruation with intervals of 22–35 days); (2) not taking any medication such as hormonal contraceptives, antipsychotics, antidepressants, vitamins; (3) not suffering from any psychiatric disorder, such as major depressive disorder, panic disorder, or epilepsy; and (4) being a resident at the university's dormitory. Exclusion criteria were (1) acquiring General Health Questionnaire (GHQ) scores more than 23; (2) suffering from any kind of psychiatric disorders; (3) consumption of any kind of antidepressants, tranquilizers, and psychiatric medicine; (4) students studying physiotherapy. Individuals who did not meet inclusion criteria were excluded from the study at this stage.	Randomized clinical trial	1. Acupressure (Sanyinjiao point) 2. sham acupressure (placebo)	1. Acupressure was more effective than sham pressure. 2.The general health status of the participants changed much more after the second month in both the acupressure intervention and the sham pressure group.

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
Noroozinia et al. (2013)	152 ASA class I or II pregnant women who were candidate for elective C/S under spinal anesthesia Exclusion criteria: a past history of PONV or motion sickness, any nausea or vomiting in 24 hrs prior to C/S, patients who required i.v. opioids because of complicated or inappropriate spinal anesthesia, patients who have undergone emergent C/S because of probable high-risk vaginal delivery, obese patients, patients with previous experience of acupuncture or acupressure.	Double-blind Randomized clinical trial	(1) Intervention group: Wearing band had a button on its internal surface, right on the Pericardium 6 (Nei-Guan) point, n=76 (2) Control group: Wearing band lacking the button, n=76	(1) Acupressure as a safe complement to the more traditional approach of using drugs to prevent and/or relieve nausea and vomiting in the Cesarean section (C/S) under spinal anesthesia. (2) Significant differences in the incidence of the post-operative nausea and vomiting were found between the acupressure and control groups, with a reduction in the incidence rate of nausea from 35.5% to 13.2%.
Akbarzadeh et al. (2014)	150 patients Inclusion criteria: 18–35 years of age, term pregnancy, singleton pregnancy, and healthy fetal membranes, no history of medical, surgical, or mental problems and had faced no special problems during pregnancy.	Randomized clinical trial	(1) Supportive care group, n=50 (2) Acupressure group, n=50 (3) Control group, n=50	Maternal supportive care and acupressure during labor reduced the intensity of pain and improved the delivery outcomes.

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
Batool et al. (2015)	288 post-term pregnancy patients who referred to consulting clinic at Ali- Ibn- Abi -Talib Hospital, in Zahedan-Iran Inclusion criteria: reliable EDC, post-term pregnancy, non-consequence pregnancy, presentation of cephalic. Exclusion criteria: cervix dilatation over three centimeter, active labor, and premature rupture of membranes, previous cesarean and pathology in mother or neonate.	Randomized clinical trial	(1) Intervention group: shiatsu technique which was conducted for 30s on three points GB21, L14 and SP6, n=144 (2) Control group: routine procedure, n=144	**Percentage of spontaneous initiation of labor** Women who have used Shiatsu technique were significantly more likely to have spontaneous labour than those women who did not. Intervention vs. Control (1) Spontaneous initiation of labor: 82(56.9%) vs. 12(8.3%) (2) Mean labor initiation duration after the first technique: 25.5 h vs. 9.9h (3) Mean labor stages: 15.4h vs. 13.2h
MafetoniI et al. (2015)	156 patients Inclusion criteria: any age or parity, from 37 weeks of gestation in spontaneous, induced, and/or augmented labor with dilation ≥ 4 cm, 2-3 contractions every 10 min, with undamaged skin at the bilateral SP6 points, and whose fetus was alive in cephalic vertex position with good vital signs. Exclusion criteria: pre-eclampsia, placenta previa, two or more previous cesarean	Double-blind randomized clinical trial	(1) SP6 acupressure group, n=52 (2) Touch (placebo) group, n=52 (3) Control group, n=52	**(1)Labor duration (min)** The SP6 acupressure may shorten the labor duration. **(2)Type of delivery** The SP6 acupressure point did not affect the cesarean section rate.

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
	sections, or immediate indication for this mode of delivery.			
Akbarzadeh et al. (2016)	150 patients Inclusion criteria: being primiparous or multiparous, being physically and mentally healthy, having at least diploma, being 18-35 years old, singleton pregnancy, cephalic presentation, gestational age of 37-42 weeks, 4cm dilation, and having at least 2-3 uterine contractions in 10 minutes. Exclusion criteria: with preeclampsia, induced labor, non-cephalic presentation, cephalopelvic disproportion, multiple birth, and those who smoked, suffered from underlying diseases, and were unwilling to take part in the study	Randomized clinical trial	(1) Supportive care group, n=50 (2) Acupressure group, n=50 (3) Control group, n=50	**Labor Length** Continuous support and acupressure could reduce the length of labor stages. **Infant's Apgar Score** Continuous support and acupressure could increase the infants' Apgar scores.

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
Levett et al.	176 patients Inclusion criteria: having a singleton pregnancy with a cephalic presentation, low risk , first-time mothers and knowledge of sufficient English. factors, being enrolled or intending to enrol in a 'continuity of care' midwifery programme or in a private birth preparation course.	Open-label Assessor blind clinical trial	(1) study group: received the Complementary Therapies for Labour and Birth (CTLB) protocol in addition to usual care, n=89 (2) control group: received usual care alone, n=87	**(1)Primary outcome: Rate of analgesic epidural use** The Complementary Therapies for Labour and Birth study protocol significantly reduced epidural use. RR=0.37 (95% CI = 0.25 to 0.55), p≤0.001. **(2)Secondary outcomes : onset of labour, augmentation, mode of birth, newborn outcomes** The study group participants reported a reduced rate of 1) augmentation (RR=0.54 (95% CI = 0.38 to 2) caesarean section (RR=0.52 (95% CI = 0.31 to 0.87), p=0.017) 3) length of second stage (mean difference= −0.32 (95% CI = −0.64 to 0.002), p=0.05) 4) any perineal trauma (0.88 (95% CI = 0.78 to 0.98), p=0.02) 5) resuscitation of the newborn (RR=0.47 (95% CI 0.25 to 0.87), p≤0.015) There were no statistically significant differences found in 1) spontaneous onset of labour, pethidine use

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
				2) rate of postpartum haemorrhage 3) major perineal trauma (third and fourth degree tears/episiotomy) 4) admission to special care nursery/neonatal intensive care unit (p=0.25).
Mafetoni et al. (2016)	156 pregnant women were randomised into three groups **Inclusion** criteria: ≥37 week/s, cervical dilation ≥4cm, two or more contractions in 10 mins. **Exclusion** criteria: serious preeclampsia, placenta previa, immediate indication of cesarean, dilations at ≥ 8 cm and those that used analgesics for less than six hours from the study admission time.	Randomized clinical trial	(1) Acupressure group: San-jiao point (SP6), received deep pressure (± 5kg), n=52 (2) Touch group (TG): placebo, received a superficial touch (± 100g), n=52 (3) Control group, n=52	VAS before the treatment (N=52 for each group): average (dp) SP6 7.4 (1.9) / Touch 7.1 (2.4) / Control 7.9 (1.9) VAS 20 mins of the treatment (N=52 for each group): average (dp) SP6 5.9 (2.3) / Touch 7.6 (2.5) / Control 8.5 (1.9) VAS 60 mins of the treatment: average (dp) SP6 (N=43) 6.5 (2.2) / Touch (N=47) 8.1 (2.3) / Control (N=44) 8.8 (1.8) Perception of the main (20 mins): n

Author(Year)	Population	Study design/ Study periods	Intervention	Outcomes
				(Alleviated, No change, Worse) SP6 (34,17,1) / Touch (7,22,23) / Control (1,24,27) Perception of the main (60 mins): n (Alleviated, No change, Worse) SP6 (9,26,8) / Touch (4,12,31) / Control (0,14,30)
Abadi et al. (2017)	120 patients who were candidates for cesarean section. **Exclusion** criteria: postoperative use of acute and chronic opioid, age older than 45 years, received spinal analgesia during surgery, having preexisting airways and peripheral vascular disease, patients who required stomas, underwent blood loss (>1000 mL) and needed transfusion, had thyroid disorders or nervous, muscular, and hepatic diseases or developed intraoperative problems or complications during cesarean section, including hysterectomy and abnormal bleeding were excluded.	Randomized controlled trial	(1) Acupressure group: the acupoints including Zusanli (stomach meridian ST-36) and Hegu (large intestine meridian IL-4), n=60 (2) Control group (no acupressure): received conventional medical care, n=60	Acupressure v.s. No acupressire (a) the time to first defecation (h): 25.9±5.9 v.s. 29.1±10 (p=0.311) (b) time to first passage of flatus (h): 17.7±6 v.s. 25.75±9.1 (p<0.001) (c) time to presence of bowel sounds (h): 6.2±1.6 v.s. 12.6±2.4 (p<0.001) (d) duration of postoperative bed rest (h): 14.2±4 v.s. 16.2±5.1 (p=0.005)