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Systematic Review (Pages: 9645-9656)

The Effect of Herbal Medicines on Postpartum Depression, and Maternal-Infant Attachment in Postpartum Mother: A Systematic Review and Meta-Analysis

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Abstract

Background: Postpartum depression has negative effects on mother, child and family. Regarding the side effects of antidepressants and because of contradictory results on the effects of herbal medicines, the present meta-analysis was conducted to evaluate the efficacy of herbal medicines in treatment of postpartum depression and maternal-infant attachment.

Materials and Methods: An extensive search was done in databases of Medline, EMBASE, Scopus, Cochrane, and Web of Science in English databases as well as IranDoc, Magiran, Medlib and SID, in Persian databases with no time limitations until November 2018. Two independent researchers screened articles, in the next step, full texts of probably relevant articles were summarized and categorized based on the evaluated outcomes and overall effect size was presented.

***Results*:** The meta-analysis of five trials showed score of depression was lower in herbal medicines group compared to placebo (Standardized Mean Difference [SMD= -0.648], 95% confidence interval [CI]: -0.849 to -0.446). Heterogeneity was non-significant (I^2=0%, p=0.476). Meta-analysis of compounds containing lavender decreased score of depression significantly compared to control group. Heterogeneity was non-significant (SMD=-0.629, 95%CI: -0.847 to -0.411, I^2=9.8%, p=0.34). The lavender meta-analysis of three studies showed a significant effect in comparison to control group (SMD=-0.570, 95%CI: -0.799 to -0.341; I^2=9.8%, p=0.34). The aromatherapy meta-analysis showed that aromatherapy with or without massage could lead to a significant decrease in score of depression compared to control group (SMD= -0.637, 95%CI: -0.924 to -0.333; I^2=66%, p=0.084). Some herbal medicines showed a significant effect on maternal-infant attachment and feelings toward baby scale.

***Conclusion*:** Herbal medicines can be considered as an alternative option in treatment of postpartum depression. Also, maternal-infant attachment and feelings toward baby scale were affected by herbal medicines.

Key Words: Depression, Herbal medicines, Postpartum, Meta-analysis.

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1- INTRODUCTION

Postpartum depression is one of the most vulnerable stages in some women's lives. Women experience varying physical, mental and psychological complications during this period (1, 2). Postpartum depression is one of the most common postpartum psychological disorders and usually occurs among women two to six weeks after childbirth (3). It is known to be a major depressive disorder in the United States Psychiatric Society. It is associated with depression symptoms such as appetite variations, insomnia, energy loss, low self-esteem, cognitive problems, and anxiety (4, 5). The prevalence of postpartum depression has been reported differently in various studies. The incidence of postpartum depression after the first birth is about 10-15% (6).

In addition, its prevalence has been reported to be about 34.8% in Iran (7). The postpartum depression has negative and harmful effects on mother, child and family, relationships with the spouse, interactions and behavior with the child, and puts the infant under developmental disorder. It also leads to behavioral, cognitive and socio-emotional problems in the infants until the age of 4-8 years (8-10). As depressed mothers may suffer from attachment with their infants during pregnancy and postpartum (11).

This failure in bonding can influence infants behavioral, and cognitive development, growth failure, separation anxiety disorder and psychosocial disorder (11, 12). Depending on the causes of postpartum depression, its treatment is different. Antidepressants are among the therapeutic methods for this disorder. Selective serotonin reuptake inhibitors (SSRIs), and serotonin-norepinephrine reuptake inhibitors (SNRIs) are the first line of drug therapy (6, 13, 14). Taking antidepressants during lactation is controversial. Most manufacturers of these medications prohibit lactation while taking these drugs in spite of the well-known positive effects of breastfeeding on the health of the baby (14). Although no absolute contraindication has been reported for taking the antidepressants, the Food and Drug Administration (FDA) has not declared any comments on the use of these drugs during pregnancy and afterwards (15). On the other hand, considering the side effects of drug therapy, it is necessary to use an alternative therapeutic approach with fewer side effects in mother and infant (16). Due to the complications of postpartum depression and the better prognosis of this disorder with early treatment, prompt identification and treatment should be considered for this disorder. Therefore, it seems useful to employ complementary and herbal therapies that are often associated with high acceptance (2). The present systematic review and meta-analysis was conducted on previous studies to evaluate the efficacy of herbal therapies in treatment of postpartum depression and maternal-infant attachment.

2- MATERIALS AND METHODS

2-1 Search Strategy

The current systematic review was started through searching databases such as Medline (via PubMed), Scopus, Web of Science, EMBASE, and Cochrane Library in English database as well as IranDoc, Magiran, Medlib, and SID in Persian database with no time limitations since inception to November 1st, 2018. In addition, a manual search was conducted in Google motor engine, Google Scholar, and bibliography of related articles and reviews. English keywords were searched as follows: (Complementary treatment OR Alternative treatment OR Phytomedicine, Herbal treatment, Lavender OR Saffron stigma OR Crocus sativus OR Aromatherapy) AND (Postpartum

depression or mother-to-infant bonding OR mother–child bonding OR Maternal-child bonding OR Maternal-infant bonding OR mother-to-infant attachment OR mother–child attachment OR Maternal-child attachment OR Maternal-infant attachment). The title and abstract of the articles were reviewed by two separate researchers; then, the full text of the related articles was read and assessed in detail. If there was disagreement between the two reviewers, was resolved with third person. Those articles that met our systematic review inclusion criteria were enrolled in the meta-analysis.

2-2. Inclusion criteria

The inclusion criteria were quasi-experimental or clinical trials of the effect of herbal medicines on postpartum depression or maternal-infant attachment in postpartum mother.

2-3. Data extraction

Based on a pre-defined checklist the required data including the name of the first author, the published year, region of study (country, city), measurement instrument, comparability of the treatment and control groups, intention to treat reporting (ITT), number of participants in treatment and control groups and the percentage of drop outs were extracted by two separate authors.

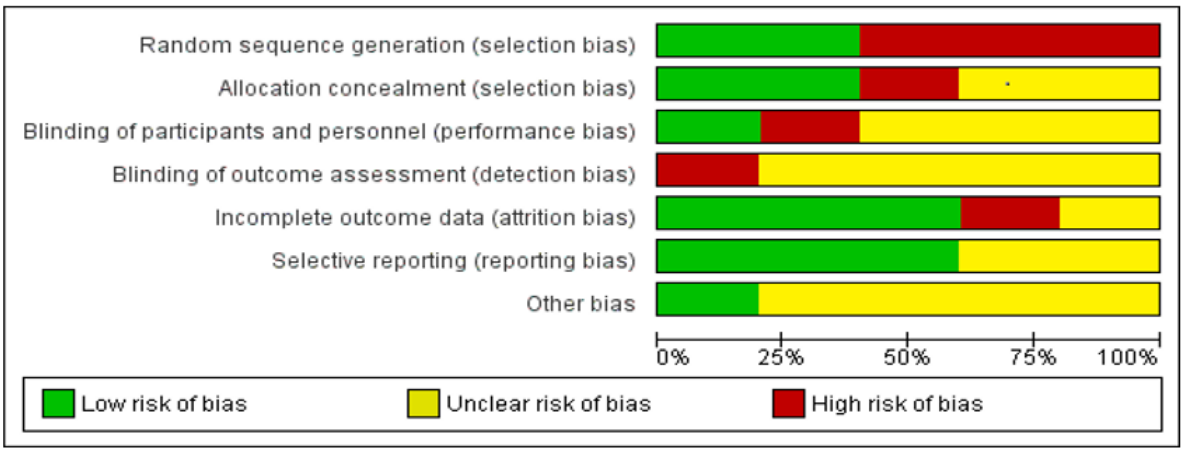
2-4. Quality assessment

After conducting the search and eliminating duplicated reports, two independent researchers screened the title and abstracts of the studies and then potentially relevant studies were selected. Any disagreement was solved by discussion. Data related to the design of the study, the name of the first author, the year of publication, age of participants, study design, number of participant interventions/ control, type of treatment, measurement tool, etc. were recorded. The quality of the studies was assessed using Cochrane's proposed guidelines (17).

The risk of bias of the included studies was assessed by two authors independently using the criteria of the Cochrane Handbook for Systematic Reviews of Interventions (18) that evaluated: (a) random sequence generation; (b) allocation concealment; (c) blinding of participants and personnel; (d) blinding of outcome assessment; (e) incomplete outcome data; (f) selective reporting; and (g) other bias. In this assessment, each item was scored as ‘low’, ‘high’ or ‘unclear’ risk of bias (**Figure.1**).

2-5. Statistical analysis

The standardized mean difference (SMD) was reported for the main effect size. A random effects model was used to express the attained data regarding heterogeneity found in the articles, which was assessed by Cochrane Q test and I^2 index. P-value less than 0.05 was considered to be statistically significant.



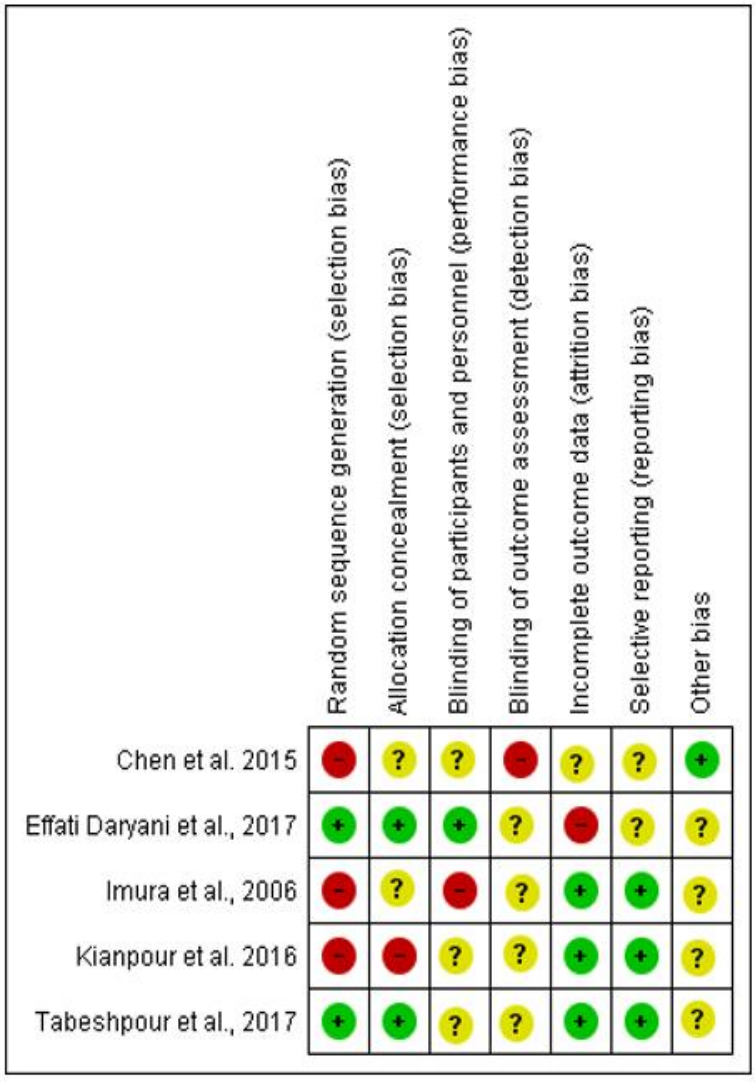


Fig.2: Quality control of eligible studies.

3- RESULT

Table.1 shows the baseline characteristics of studies included in our systematic review. Process of selecting the studies which were included in meta-analysis is shown in **Figure.2**. *Please see the table.1 at the end of paper.*

A. Systematic review results

3-1. The effect of Lavender tea on maternal-infant attachment

The postpartum bonding questionnaire is a self-report instrument with 25 items designed to detect mother-infant relationship impairment. It is divided into four subscales: impaired bounding, rejection and anger, anxiety about care, and risk of abuse. Higher score showed poor mother-to-infant bonding (19). ANCOVA test showed more improvement in Lavender tea group compared to control group ($p=0.049$) at the second week as adjusted using education level as the covariate. Improvement was borderline for fourth week in postpartum period ($p=0.05$) (20).

3-2. The effect aromatherapy-massage on feelings toward baby scale

"Feelings Toward Baby" scale ($p<0.005$) was higher in the aromatherapy-massage group than control group. Whereas, difference between two groups was not significant regarding avoidance feeling ($p= 0.097$) (21).

3-3. The effect of herbal medicine on postpartum depression

Chen et al. (20) divided women with postnatal sleep problem into two groups. The first group drank one cup of lavender tea after smelling and the second group received regular postpartum care. ANCOVA analysis with educational level as confounding variable showed that depression score was lower in Lavender tea group compared to control group at the 2nd week after treatment ($p=0.033$). Imura et al. (21) in their clinical trial, randomized the patients into two groups to receive aromatherapy-massage or placebo. Oils used in the massage were a mixture of Neroli (*Citrus aurantium*), and Lavender (*Lavendula officinalis*). Score of maternity blues decreased significantly in aromatherapy massage ($n=16$) compared to control group ($n=20$) ($p=0.001$). Kianpour et al. compared two groups of aromatherapy with Lavender and non-aromatherapy. Score of depression was lower in intervention group compared to control group ($p=0.003$) (22).

Effati Daryani et al. (2) compared three groups: Lavender cream ($n=47$) in combination with footbath ($n=47$), Lavender cream alone ($n=47$), and placebo ($n=47$). Comparison of these groups regarding score of depression using ANOVA analysis showed a significant difference among three groups. ANOVA analysis was followed by post hoc test and showed that score of depression was lower in both Lavender alone ($p<0.001$), and Lavender in combination with footbath compared to control group ($p<0.001$).

However, comparison of two groups (Lavender and Lavender combined with footbath) was non-significant. Tabeshpour et al. (23) conducted a double-blind, randomized, placebo-controlled trial to evaluate saffron in mothers with mild to moderate postpartum depression. The depression score changed significantly from 20.3 to 8.4 ($p<0.01$) in saffron group, and 19.8 to 15.1 in placebo group ($p<0.01$). The rate of response to treatment was 6% in placebo group in comparison to 66% in saffron group ($p<0.01$).

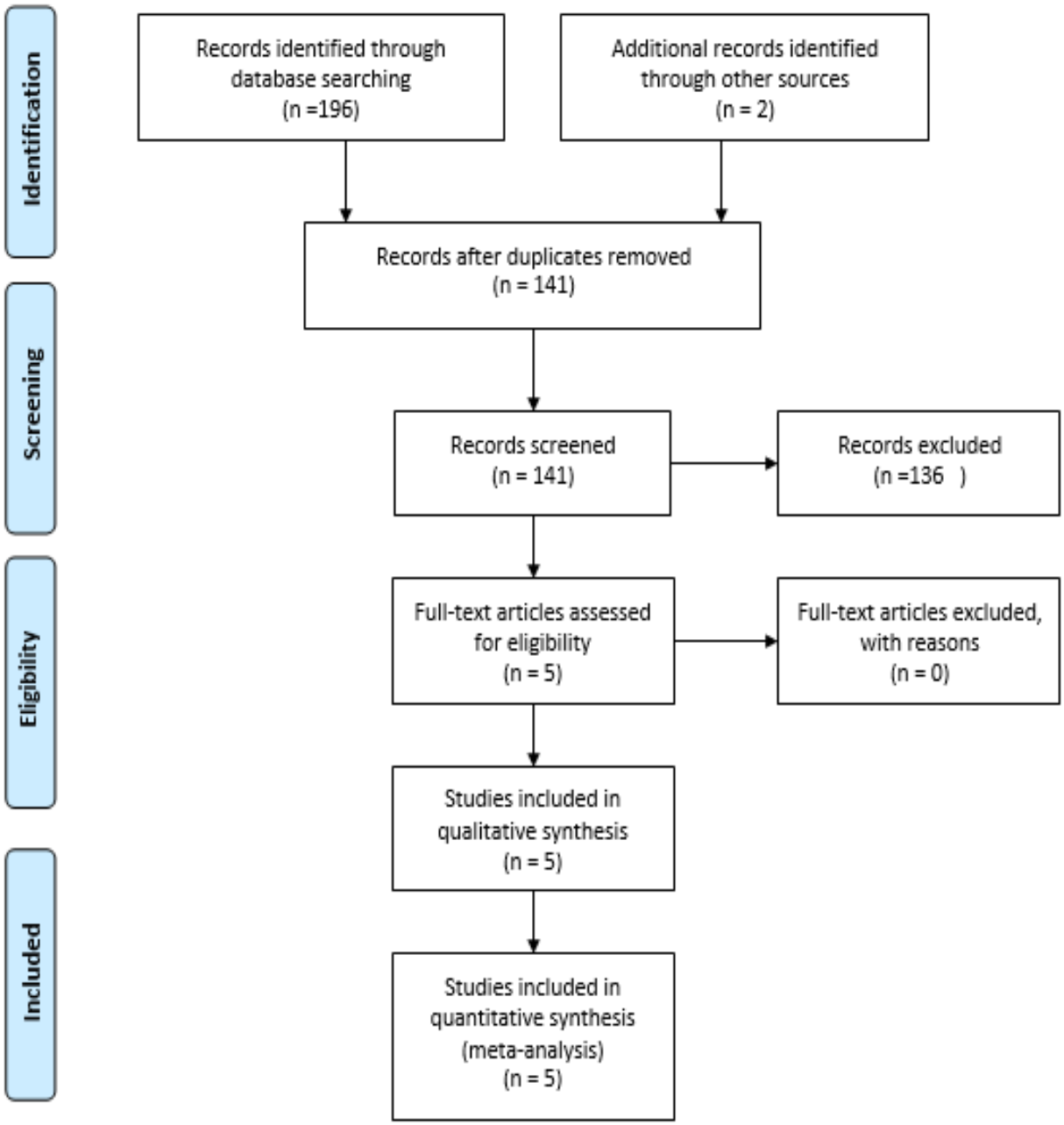


Fig.2: PRISMA flowchart of present study.

B. Meta-analysis

Five studies had information that was sufficient for include in the meta-analysis of the effect of herbal medicines on postpartum depression (2, 20, 21-23). Combination of the findings of five herbal medicines in our meta-analysis showed that score of depression was lower in herbal medicines compared to placebo (Standardized Mean Difference [SMD=-0.648], 95%CI: -0.849 to -0.446). Heterogeneity was non-significant (I^2=0%, p=0.476) (**Figure.3)**.

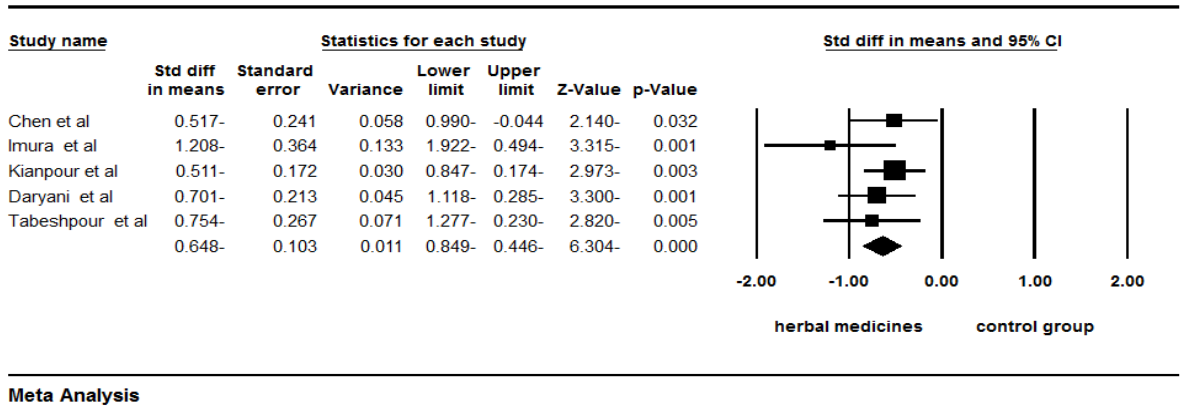


Fig.3: The effects of herbal medicines on postpartum depression. The horizontal lines denote the 95% confidence interval, ■ point estimate (size of the square corresponds to its weight); ♦, combined overall effect of treatment.

Meta-analysis of compounds containing lavender decreased the score of depression compared to control group significantly. Heterogeneity was non-significant (SMD=-0.629, 95% CI: -0.847 to -0.411; I^2=9.8%, p=0.34, **Figure.4**).

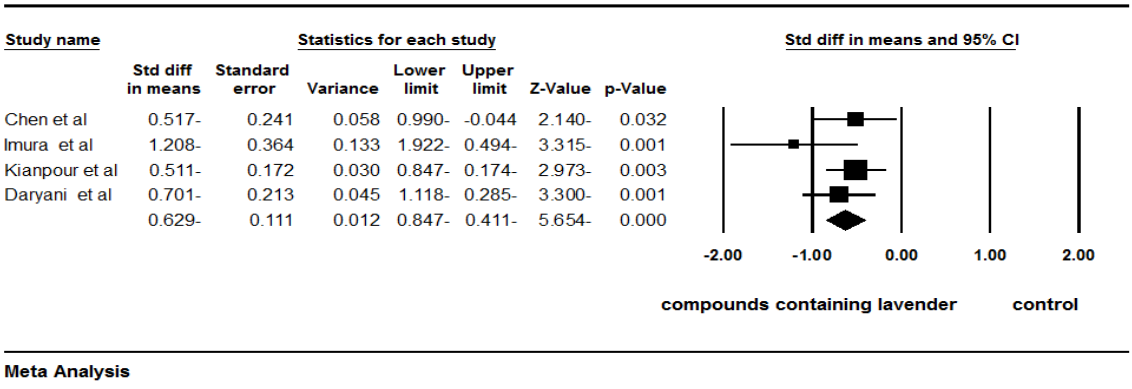


Fig.4: The effects of compunds containing lavender on postpartum depression. The horizontal lines denote the 95% confidence interval, ■ point estimate (size of the square corresponds to its weight); ♦, combined overall effect of treatment.

The Lavender alone meta-analysis with three studies showed a significant effect in comparison to control group (SMD=-0.570, 95%CI: -0.799 to -0.341; I^2=9.8%, p=0.34, **Figure.5**).

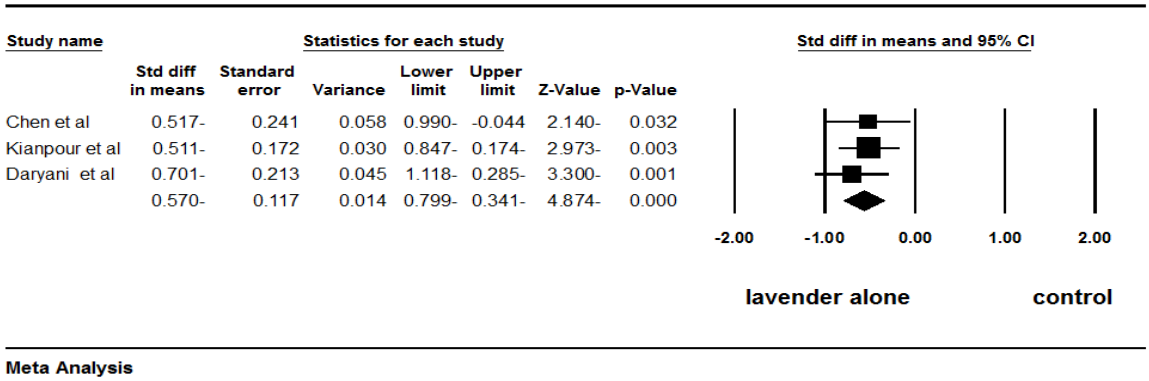


Fig.5: The effects of lavender alone on postpartum depression. The horizontal lines denote the 95% confidence interval, ■ point estimate (size of the square corresponds to its weight); ♦, combined overall effect of treatment.

The aromatherapy meta-analysis showed that aromatherapy could lead to a significant decrease compared to control group (SMD=-0.637, 95%CI: -0.924 to -0.333; I^2=66%, p=0.084, **Figure. 6**). A moderate heterogeneity was present among studies that assessed the effect of aromatherapy on postpartum depression.

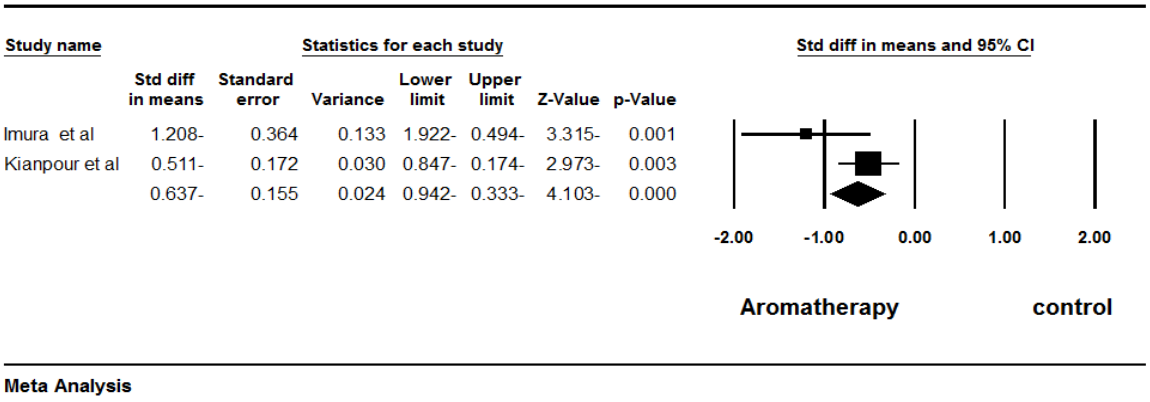


Fig.6: The effects of compounds containing aromatherapy on postpartum depression. The horizontal lines denote the 95% confidence interval, ■ point estimate (size of the square corresponds to its weight); ♦, combined overall effect of treatmet.

4- DISCUSSION

The present meta-analysis was the first meta-analysis conducted to evaluate the efficacy of herbal medicines in treatment of postpartum depression and maternal-infant attachment. Our meta-analysis showed good effect of herbal medicines as oral, compounds containing lavender, and lavender alone on postpartum depression compounds containing lavender significantly decreased score of depression than control group. The aromatherapy

meta-analysis showed that aromatherapy with or without massage could improve postpartum depression. Some herbal medicines showed a significant effect on maternal-infant attachment and feelings toward baby scale. Postpartum depression (PPD) has serious and negative effects on the mother, the baby, and family, which adversely impacts the mother-child relationship and growth and development of the infant. In fact, the PPD has a negative effect on all aspects of the quality of life of the mothers (5, 24, 25). To the best of our knowledge, this is the first meta-analysis of efficacy of trials comparing herbal medicines with placebo on PPD, and maternal-infant attachment.

This systematic review covered eight trials investigating the herbal medicines Lavender alone, Lavender in combination with Neroli (Citrus aurantium), and Saffron stigma. Herbal medicines were used as tea, aromatherapy and capsule. Three special measurement tools were used to measure postpartum depression. Edinburgh Postnatal Depression Scale (EPDS), Beck Depression Inventory-Second Edition (BDI-II), Maternity Blues Scale (MBS), and Depression Anxiety and Stress Scales (DASS-21). Five trials were included in the meta-analysis. In the first study, lavender in tea form was more effective than placebo in relief of score of depression in postpartum in sleep-disturbed postnatal women (20).

In the second study, aromatherapy-massage with a combination of Lavender and Neroli, showed a significant effect as compared to placebo in healthy postpartum mothers (21). In the third study, both Lavender alone and Lavender in combination with footbath were more effective compared to control group in healthy postpartum women (2). In the fourth study, Saffron significantly decreased depression score in mothers with mild to moderate postpartum depression. In the fifth study, aromatherapy with lavender prevented depression in postpartum period (22). Some herbal medicines showed a significant effect on maternal-infant attachment and feelings toward baby (19). Five studies included in the meta-analysis showed that herbal medicines are superior to placebo. Aromatherapy is known as a component of complementary medicine (26, 27), which refers to the inhalation of pure essential oil or massage with essential oil with slight skin absorption (18). Meta-analysis also showed that aromatherapy was more effective than placebo in deceasing score of depression. Lavandula angustifolia, from the family Lamiaceae is an herbaceous herb and its aromata has a significant positive effect on the digestive and central nervous systems and has been proven to have analgesic, anti-inflammatory and calming effects in various studies (28-30). Lavender alone or in combination with Neroli had good effect on PPD. Linalool and linalyl acetate as the most important compounds in lavender have the highest absorption levels through the skin following massage with essential oil; so that they can be detected rapidly in the plasma after topical application, and their levels reach the highest limit after about 19 minutes.

The linalool has sedative properties and linalyl acetate functions as a painkiller, and can improve euphoria and moderate mental alertness. It is believed that the use of lavender cream, due to the inhalation of the aroma of essential oil in the cream, can improve anxiety by reducing cortisol levels and elevate the serotonin levels. A study showed that the foot bath using the lavender essential oil could create small but significant changes in the autonomic activity and increase parasympathetic activity to enhance relaxation (2). Crocus sativus L. (Saffron) from the family Iridaceae, is an herbaceous, non-stem and perennial crop which is cultivated in Spain, France, and Greece, and widely

distributed in the central and eastern regions of Iran. The most important compositions in the saffron stigma include carotenoids, monoterpene aldehydes, isophorone and flavonoids. In addition to the use of saffron as an essence in various industries, it has several medicinal and therapeutic properties and applications. Traditional medicine has pointed to some of the beneficial effects of the saffron. Saffron is known to have antipyretic, analgesic, anti-spasm, sedative and digestive properties (31).

4-1. Study Limitations

All studies reported intention to treat. Procedure of randomization, concealment of randomization and blinding was not described. It is strongly recommend that trials should be designed and reported in accordance with consort statement. The current systematic review assessed the effect of herbal medicines on postpartum depression symptoms. Future studies should assess the efficacy of herbal medicines on postpartum depression.

5- CONCLUSIONS

Herbal medicines, especially lavender alone or in combination with other herbal medicines in both route aromatherapy and oral had beneficial effect on postpartum depression and mother-infant attachment, and can be considered as an alternative option in treatment of postpartum depression, especially in Iran where both health care providers and people are interested in herbal medicines. However, well-designed studies with acceptable sample sizes are required to confirm current findings.

6- CONFLICT OF INTEREST: None.

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Table-1: Characteristics of five studies included in our systematic review.

Author, Year, Country, Reference	Duration, week	Age, year	Measurement tools	Drop out%	Type of treatment	Type of control	Number of participants Treatment/ Control	ITT	Basel Comparability of the treatment and control groups	Adverse effect	Major relevant findings
Kianpour et al., 2016, Iran (22)	4	---	21-item Edinburgh stress, anxiety, and depression scale	18.1	Aromatherapy consisted of inhaling three drops of lavender essential oil every 8 h for 4 weeks	Received routine care	70/70	No	No	------	The mean stress, anxiety, and depression at time point of 2 weeks ($p=0.012$, $p<0.0001$, and $p=0.003$, respectively) and stress, anxiety, and depression scores at time points of 1 month ($p < 0.0001$) and 3 months after delivery ($p<0.0001$) were significantly lower in the study group compared with the control group.
Chen and Chen, 2015, Taiwan (20)	4	32	PSQS, Edinburgh Postnatal Depression Scale	11.2	Drink one cup of lavender tea after smelling (appreciating) its aroma 1 hour before bedtime for a period of 2 weeks	Received regular postpartum care only	40/40	No	Yes	-----	ANCOVA analysis with educational level as confounding variable showed that depression score was lower in lavender tea group compared to control group at week 2 after treatment ($p=0.033$).
Tabeshpour et al., 2017, Iran, (23)	8	28	BDI-II	23	Tablet saffron (15 mg/Bid)	Placebo tablets, two tablets to be taken twice daily	30/30	No	Yes	-----	The depression score changed significantly from 20.3 to 8.4 ($p<0.01$) in saffron group, and 19.8 to 15.1 in placebo group ($p<0.01$). Rate of response to treatment was 6% in placebo group in comparison with 66% in saffron group. Comparison of two groups was significant.
Effati Daryani et al., 2017, Iran, (2)	6	27.7	DASS-21	2.1	Group.1: received Lavender cream Group.2: Footbath and Lavender cream	Placebo cream	47/47/47	No	Yes	----	ANOVA analysis was followed by post hoc and showed that score of depression was lower in both Lavender alone ($p<0.001$), and Lavender in combination with footbath compared control group ($p<0.001$).
Imura et al., 2006, Japan, (21)	30 min	31	Maternity Blues Scale,	---	Aromatherapy-massage	Received regular postpartum care only	16/20	No	Yes	-----	The aromatherapy massage group experienced significantly lower Maternity Blues Scale, the State-Anxiety Inventory scores after receiving aromatherapy-massage than those of the control group.