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Review article

The effect of herbal medicines on postpartum hemorrhage: a systematic review of clinical trials

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Abstract

Objective: This study reviewed clinical trials conducted on the effect of herbal medicines on managing postpartum hemorrhage (PPH). To address the critical need for effective and safe interventions in PPH, this review synthesized existing evidence on the role of herbal medicines.

Materials and methods: This systematic review identified relevant articles published between 2000 and 2025 across multiple databases including the Iranian Registry of Clinical Trials (IRCT), Google Scholar, PubMed, Magiran, Scopus, and the Scientific Information Database. The search strategy employed keywords such as postpartum hemorrhage, PPH control, PPH prevention, phytotherapy, herbal medicine, complementary medicine, and traditional medicine. Article quality was assessed using the Cochrane Risk-of-bias tool, and findings are reported qualitatively.

Results: This systematic review extracted 224 articles, of which 18 clinical trials met the inclusion criteria. These studies investigated 11 distinct herbal medicines: grape seed, ZB11, *Matricaria chamomilla*, *Plantago major*, *Phoenix dactylifera*, *Anethum graveolens dhi*, *Shenghua decoction*, *Cuminum cyminum* L, *Urtica dioica*, *Capsella bursa-pastoris*, and *Rhus coriaria*. The results suggest that the herbal medicines could be valuable for managing postpartum hemorrhage.

Conclusion: The herbal medicines reviewed in this study show promise in the prevention and control of postpartum hemorrhage. Further rigorous research is necessary to definitively establish their efficacy and safety in managing PPH.

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Introduction

Postpartum hemorrhage (PPH) is defined as a cumulative blood loss of ≥500 mL within 24 hr after delivery (Andrikopoulouet al. 2019; Ayadi et al. 2013; Negura 2016). It remains a critical global health concern and a leading cause of maternal mortality (Newsome et al. 2017; Pacheco et al. 2019), accounting for approximately 25% of all maternal deaths annually (Ayadi et al. 2013). Despite advancements in prevention and management strategies, PPH complicates up to 10% of all deliveries (Blum et al. 2010; Winikoff et al. 2010). The global burden is estimated at 300,000 maternal deaths annually, equating to approximately 800 deaths per day, or one death every four minutes, from largely preventable complications of pregnancy and childbirth (Millimouno et al. 2019). This emphasizes the urgent need for continued research and protocols to mitigate the incidence and impact of PPH.

PPH is primarily categorized by the "four T's": Tone, Tissue, Trauma, and Thrombin (Marshall et al. 2018). Uterine atony, insufficient uterine contractions, is the predominant cause, accounting for approximately 70% of all PPH cases (Cianci et al. 2025; Koutras et al. 2021; Shirazi et al. 2011). The accurate prediction and timely diagnosis of severe PPH remain challenging, with delayed diagnosis and management contributing significantly to associated maternal mortality (Abbaspoor et al. 2017). Therefore, effective early management is crucial. Management strategies for PPH depend on the underlying cause, including mechanical, pharmacological, non-pharmacological, and surgical interventions. Initial recommended approaches include oxytocin administration, uterine evacuation, bladder management, and uterine massage (Beyable et al. 2022; Biana et al. 2021; Karimi et al. 2019; Khadivzadeh et al. 2018). In case of bleeding, intravenous prostaglandins or 15-methyl prostaglandin F2α may be administered. Immediate surgical intervention becomes necessary when medical management proves insufficient. Intrauterine balloon tamponade is often the preferred initial surgical approach for uterine atony (Finlayson et al. 2021). If this measure fails to control the hemorrhage, further surgical interventions may include uterine hemostatic sutures (e.g. B-Lynch suture), bilateral uterine artery ligation, bilateral internal iliac (hypogastric) artery ligation, and selective arterial embolization (Hashemi Petroudi et al. 2020).

While conventional drugs effectively manage PPH, their side effects and costs require safer and more affordable treatment options. Consequently, there has been a growing global interest in herbal products and traditional medicine for their perceived lower risk profiles and potential to prevent or mitigate bleeding (Aimagambetova et al. 2024; Ghalandari et al. 2017; Ghalandari et al. 2016; Ginnane et al. 2024).

Several herbal medicines have been investigated for their effectiveness in controlling PPH (Izadpanah et al. 2018; Khojastehfard et al. 2019; Naafe et al. 2016; Yadegari et al. 2016). A study by Ghalandari et al. demonstrated the efficacy of *Capsella bursa-pastoris* in reducing PPH (Ghalandari et al. 2017). Research by Yadegari et al. suggested that date consumption during the postpartum period reduces PPH (Yadegari et al. 2016).

Izadpanah et al. reported that grape seed powder effectively reduced PPH (Izadpanah et al. 2018). Khojestehfard et al. noted the beneficial effect of *Plant ago major* rectal suppositories on reducing PPH (Khojastehfard et al. 2019). Other traditionally used plants include Rutab date and dill seeds.

The historical use of herbal remedies for female hemorrhage demonstrates a long-held understanding of their therapeutic benefits. Given the importance of PPH as a leading cause of maternal mortality, extensive research has explored traditional and herbal approaches globally, yielding diverse findings. However, a comprehensive systematic review

synthesizing these dispersed results has been notably absent. Given the importance of effective, non-invasive, cost-efficient interventions with the lowest adverse effects for PPH, this study reviewed clinical trials conducted on the effect of herbal medicines (oral, injectable, topical, or herbal beverage) compared with placebo or standard care on postpartum hemorrhage (ml) in postpartum women (vaginal or cesarean section).

Materials and Methods

The present study was a systematic review of randomized controlled trials (RCTs) designed to investigate the effect of herbal medicines on PPH. This review was conducted according to the PRISMA guidelines. The PICOS framework was as follows: Participants: Postpartum women (vaginal or cesarean section); Intervention: Herbal medicines (oral, injectable, topical, or herbal beverage); Comparator: Placebo or standard care; Outcomes: Postpartum hemorrhage (ml), Need for antihemorrhagic drugs, hemoglobin, hematocrit, adverse events; Study design: Randomized clinical trial study.

Inclusion criteria

Inclusion criteria included clinical trial studies in Persian or English that assessed the effect of herbal medicines (intervention) compared with placebo or standard care on postpartum hemorrhage (ml) in postpartum women. Articles whose full text was not available and review articles, letters to the editor, case reports, qualitative articles and quantitative articles with descriptive, cross-sectional, retrospective, cohort and quasi-experimental methodologies were excluded.

Search strategy

A comprehensive systematic search was conducted across several electronic databases, including PubMed, Scopus, Magiran, Scientific Information Database (SID), and Google Scholar, between January 1, 2000 and December 31, 2025. The search strategy employed the following keywords: postpartum hemorrhage, PPH, herbal medicine, phytotherapy, and traditional medicine. These keywords were combined using Boolean operators "AND" and "OR" to broaden and refine the search results effectively.

The detailed search strategy for PubMed was as follows: ("Postpartum Hemorrhage"[Mesh] OR "Postpartum Hemorrhage"[Title/Abstract] OR "PPH"[Title/Abstract] OR "Postpartum Haemorrhage"[Title/Abstract] OR "Post-partum Hemorrhage"[Title/Abstract] OR "Postpartum Bleeding"[Title/Abstract]) AND ("Phytotherapy"[Mesh] OR "Plants, Medicinal"[Mesh] OR "Herbal Medicine"[Title/Abstract] OR "Medicinal Plants"[Title/Abstract] OR "Herbal"[Title/Abstract] OR "Phytochemicals"[Title/Abstract] OR "Traditional Medicine"[Title/Abstract]) AND ("Clinical Trials"[Mesh] OR "Clinical Trial"[Title/Abstract] OR "Randomized Controlled Trial"[Title/Abstract] OR "RCT"[Title/Abstract] OR "Randomized"[Title/Abstract]).

Study selection

All retrieved articles were independently screened based on keywords present in their titles, abstracts, and author-provided keywords. Duplicate entries were removed. The remaining studies were then screened to exclude irrelevant articles. Subsequently, the full text of the potentially relevant studies was retrieved and assessed based on predefined inclusion criteria. The included articles were evaluated qualitatively. Any disagreements between reviewers were resolved through consensus or discussion with a third researcher (Figure 1).

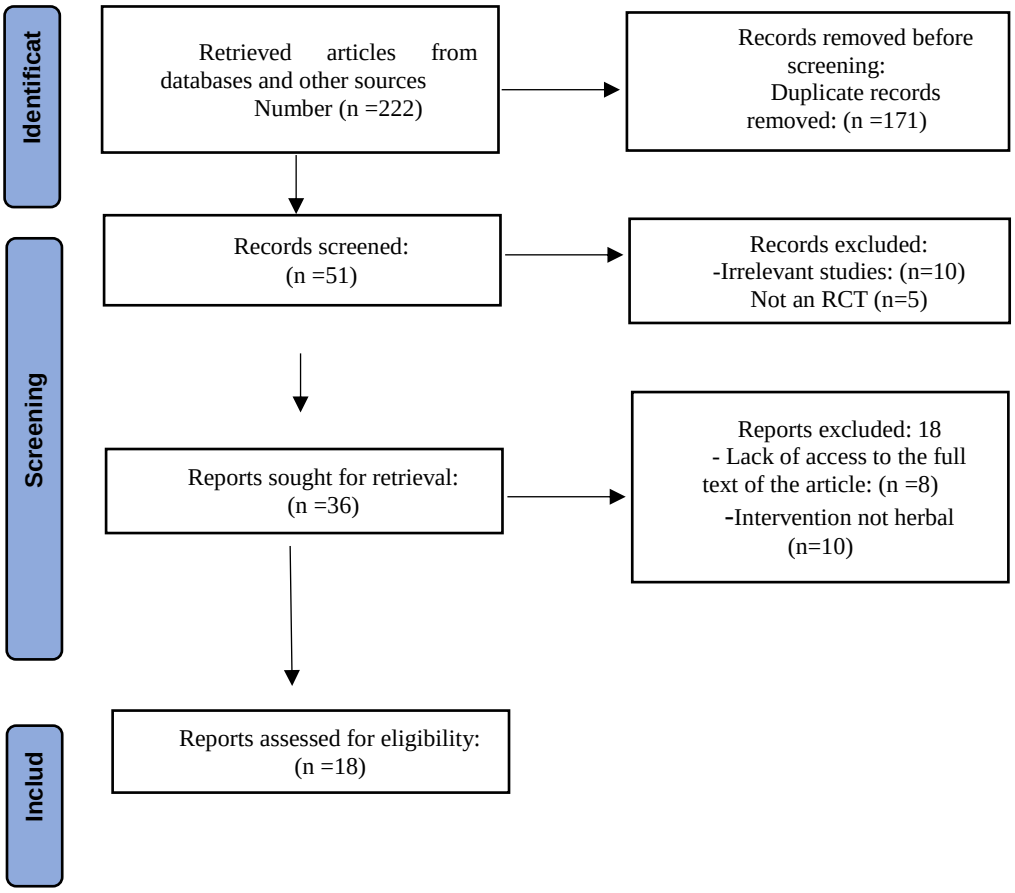

Figure 1. PRISMA flow diagram of the studies identified in the systematic review

Data extraction

Information such as the authors' names, year of publication, type of herbal intervention, type of delivery, study population, sample size, measured outcomes, and main results were extracted from each article (Table 1).

Quality assessment

Two independent evaluators examined the risk of bias for each study using the Cochrane Collaboration's tool. In the event of a disagreement between the two evaluators, a third researcher would resolve the issue. Six types of biases were assessed, including selection bias (random sequence generation and allocation concealment), performance bias (examining the blinding of participants and personnel), detection bias (the blinding of outcome assessors), attrition bias (incomplete outcome data), reporting bias (selective reporting), and other sources of biases. Based on the degree of each type of bias, the studies were assessed and reported with low, high, and uncertain risks (Figures 2 and 3).

Data synthesis

Due to the significant heterogeneity observed among the included studies, a meta-analysis was not feasible; therefore, a qualitative narrative synthesis was performed. The sources of this heterogeneity were (1) Intervention variability including different types of herbal medicines, various dosages, and different forms of administration; (2) Population differences such as variations in parity, gestational age, and risk factors for postpartum hemorrhage across the study groups; and (3) Outcome measure diversity where studies used different tools or definitions to assess blood loss and hemorrhage severity. Therefore, the results are presented descriptively to summarize the findings of the clinical trials.

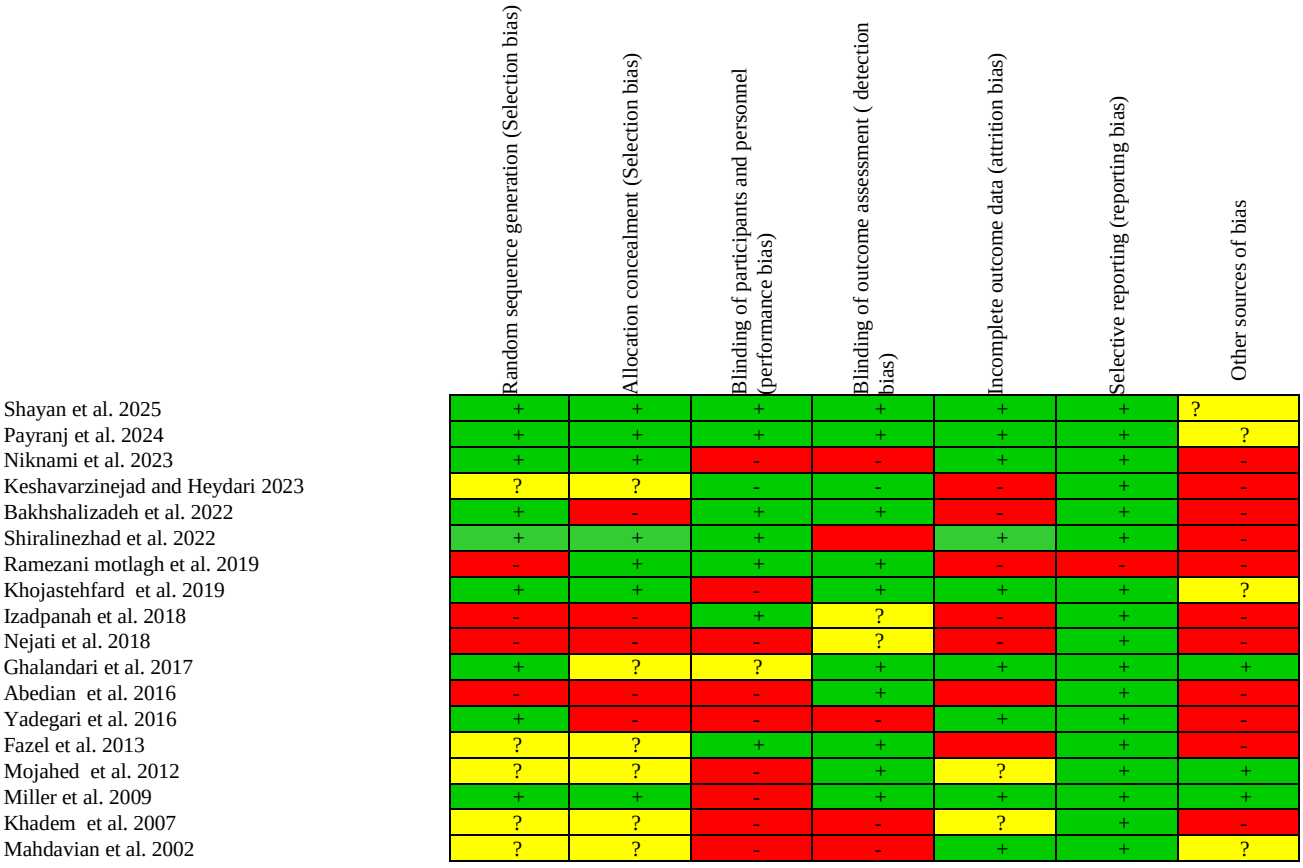

Figure 2. Risk-of-bias assessments for each study

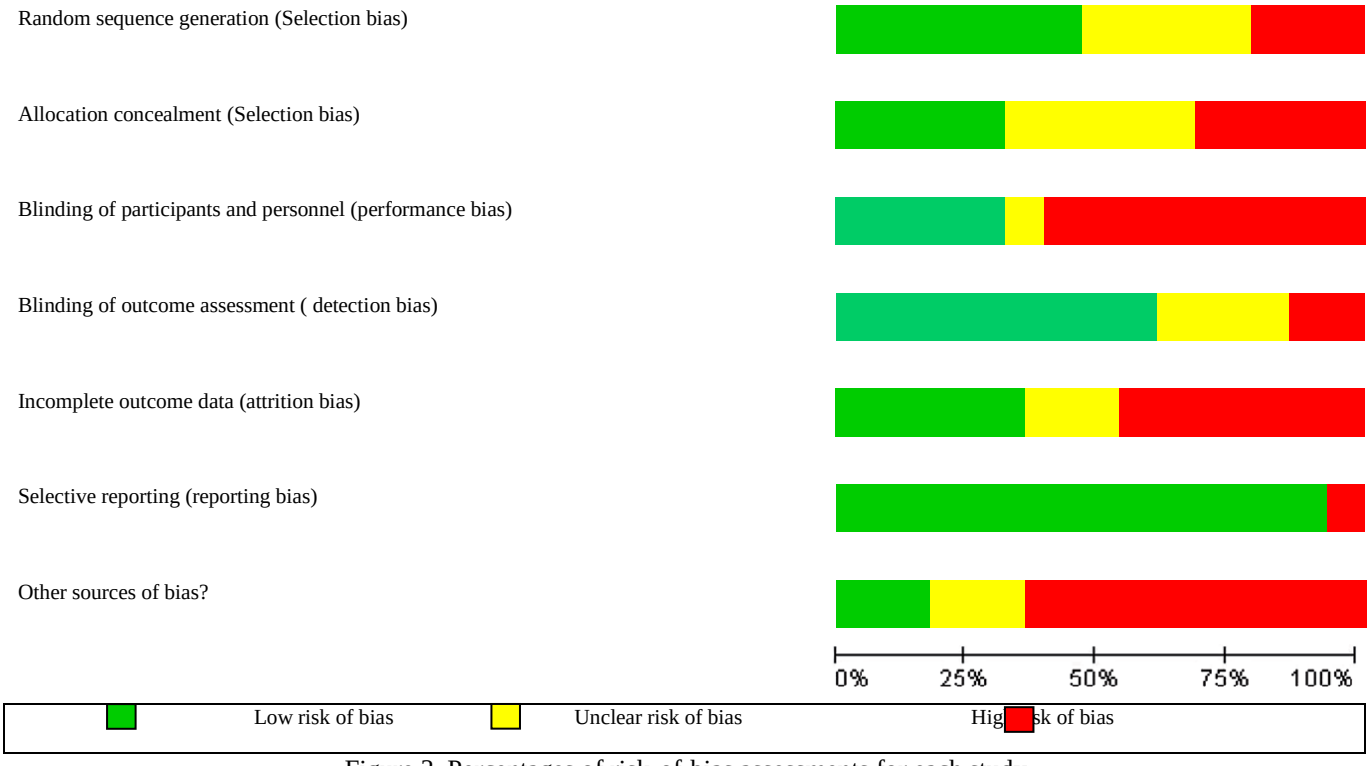

Figure 3. Percentages of risk-of-bias assessments for each study

Table 1. Characteristics of articles included in review

Row	Author /year/country	Study type	Sample	Intervention group	Control group	Measuring tool	Result	Side effects
1	(Mahdavian et al., 2001)	A single-blind, two-group randomized, clinical trial	72 women undergoing labor visiting the hospital	36 women received 0.018 g/kg of dill seed extract dissolved in 50 ml of water along with two sugar cubes.	36 women received 10 units of intramuscular oxytocin along with a solution of 50 ml of water with two sugar cubes.	Weighing gauzes consumed during episiotomy repair and the use of plastic wrap and drape in the first and second hours after delivery.	Dill seed extract was more effective than intramuscular injection of oxytocin in reducing PPH.	Not reported.
2	(Khadem et al., 2007)	A two-group randomized, clinical trial	62 women gave birth in the hospital	31 women received 50 grams of dates orally immediately after the placenta abruption.	31 women received 10 units of intramuscular oxytocin.	Weighing the pad, plastic sheet, and drapes every one to three hours after delivery.	Three hours after delivery, there was a statistically significant difference in the mean bleeding between the date group and the oxytocin group (p= 0.02).	Not reported.
3	(Miller et al., 2009)	A double-blind randomized, controlled clinical trial	Women (n = 967) in three hospitals in Lhasa, Tibet, People's Republic of China. Pregnant women aged 18 years or older with a viable intrauterine singleton pregnancy with a gestational age ≤ 28 weeks.	Group 1 received three green gel capsules of the ZB11. These capsules were produced specifically for this study using a traditional formulation by a Tibetan Traditional Medicine Factory (Lhasa, TAR, PRC).	Group 2 received oral misoprostol.	PPH was measured in a calibrated blood collection cloth. The primary composite outcome was the incidence of PPH, defined as MBL ≥ 500 mL.	The rate of PPH was lower in the misoprostol group (p = 0.02). The frequency of PPH was lower with misoprostol (P = 0.02).	Not reported.
4	(Fazel et al., 2013)	A double-blind two-group randomized, clinical trial	124 women with transverse cesarean section referred to the hospital.	58 women received 40 drops of cumin oil dissolved in 30 ml of water in three doses at 20-minute intervals 24 hours after cesarean section.	66 women received 40 drops of placebo dissolved in 30 ml of water in three doses at 20-minute intervals 24 hours after cesarean section.	Weighing the pad and drape before the intervention and after 3 hours from the first dose of the drug or placebo.	No statistically significant difference was found in the mean bleeding volume between the cumin group and the placebo group (p = 0.997).	Not reported.
5	(Mojahed et al., 2012)	A single-blind two-group randomized, clinical trial	95 women undergoing labor visiting the hospital	44 women received 100 grams of Mazafati Rutab with a glass of warm water and an infusion of 20 units of oxytocin.	51 women received 20 units of oxytocin as an infusion.	Weighing the plastic cover, drapes, and pad up to two hours after delivery.	A statistically significant difference was observed in the mean bleeding volume between the oxytocin group and date group two hours after delivery (p = 0.001).	Not reported.
6	(Abedian et al., 2016)	A double-blind two-group randomized, clinical trial	70 multiparous women gave birth in the hospital.	Receiving 1000 mg of *Matricaria chamomilla* capsules along with 30 units of oxytocin during the first 2-4 hours after delivery.	Receiving 250 grams of mefenamic acid capsules with 30 units of oxytocin within 2-4 hours after delivery.	Assessing the volume of bleeding after placental abruption until the time of intervention and every hour for six hours thereafter, by weighing the drapes and pads with a standard scale.	No statistically significant difference was found in the volume of bleeding 1, 2, 3, 4, and 6 hours after the intervention between the group receiving *Matricaria chamomilla* and the group receiving mefenamic acid (p < 0.05).	Two cases of drowsiness in the chamomile group and one case of nausea and vomiting in the mefenamic acid group.

Table 1. Continued

7	(Yadegari et al., 2016)	A two-group randomized, clinical trial	90 primiparous women visiting the hospital.	45 women received 100 g of dates within the first two hours after delivery and then 100 g of dates every day with breakfast for the first week.	45 women received less than 50 g of dates in the first week after giving birth.	Measuring bleeding using sanitary pads and a standard pectoral scale.	A statistically significant difference was observed in the volume of bleeding between the two groups receiving dates and the control group from the second to tenth days.	Not reported.
8	(Ghalandari et al., 2017)	A single-blind two-group randomized, clinical trial	100 women undergoing labor visiting the hospital.	50 women received 10 drops of hydroalcoholic extract of the *Capsella bursa- pastoris* sublingually with an infusion of 20 units of oxytocin immediately after placental abruption.	50 women received 10 drops of placebo sublingually with an infusion of 20 units of oxytocin immediately after placental abruption.	Weighing the gauzes consumed during episiotomy repair, the drape and pad every hour until three hours after delivery.	A statistically significant difference was observed in the mean PPH in a total of three hours between the group receiving sublingually hydroalcoholic extract of the *Capsella bursa- pastoris* and the control group ($p < 0.001$).	One case of throat pain and itching in the Capsella bursa pastoris group and one case of nausea in the control group.
9	(Nejati et al., 2018)	A double-blind randomized, controlled clinical trial	100 women visiting the hospital's maternity ward.	The intervention group (50) received 100 ml of 20% *Plantago major* syrup and 20 units of oxytocin in one liter of Ringer's serum immediately after the placental abruption.	The control group (50) received 100 ml of placebo syrup with 20 units of oxytocin in one liter of Ringer's serum.	Measurement of hemoglobin and hematocrit levels in all patients 6 hours after delivery.	The two groups showed a significant difference in the reduction of hemoglobin and hematocrit ($p=0.01$). The mean decrease in hemoglobin and hematocrit after delivery in the intervention group was lower than that in the control group.	None of the participants experienced any side effects from the medication.
10	(Izadpanah et al., 2018)	A double-blind four-group randomized, clinical trial	120 women undergoing labor visiting the hospital	3 groups of 30 people received grape seed powder in doses of 50, 100, and 150 mg with 20 units of oxytocin.	1 group of 30 people received placebo in the form of starch powder capsules with 20 units of oxytocin.	Assessing the volume of bleeding in the first, second, third, and 24 hours after placental abruption using pads and drapes and weighing it with a standard scale.	In the first, second and third hours after the intervention, the highest bleeding volume was observed in the placebo group (first hour) and the lowest bleeding volume was observed in the intervention group (third hour). In the average 24-hour bleeding volume, the highest was observed in the placebo group and the lowest was observed in the 150 mg grape seed group ($p < 0.001$).	Not reported.
11	(Ramezani Motlagh et al., 2019)	A triple-blind two-group randomized, clinical trial	74 postpartum mothers	A group of 35 women were given *Purslane* seed capsules. After completing the third stage of labor, one purslane capsule was given to the research unit. During the first 24 hours after the intervention, the capsules were consumed every 8 hours (up to three more doses).	A group of 35 women were given a placebo. After completing the third stage of labor, one placebo was given to the research unit.	Within 6 hours of the intervention, the amount of postpartum bleeding was measured by weighing the used pads.	No statistically significant difference was observed in the average volume of bleeding between the two groups within 6 hours after the intervention. *Purslane* seed capsules were not effective in reducing postpartum bleeding,	In the purslane group, one case of nausea was reported during the fifth hour after the intervention, and the mother received one dose of mefenamic acid half an hour before the nausea due to an afterpain score of over 4. This is because various studies mentioned the nausea complication of mefenamic acid.

Table 1. Continued

12	(Bakhshalizadeh et al., 2022)	A triple-blind two-group randomized, clinical trial	100 women presenting for vaginal delivery	After delivery, the intervention group received 10 drops of *Urtica dioica*.	After delivery, the control group received 10 drops of placebo.	Bleeding was measured up to 24 hours after delivery using the PBLAC chart. Maternal hemoglobin and hematocrit were measured at the time of going into labor and 6 hours after delivery.	A significant difference was observed in the mean blood loss in the first 24 hours after delivery between the *Urtica dioica* group and the placebo group (p=0.001). The mean decrease in hemoglobin (p=0.006) and hematocrit (p=0.001) in the *Urtica dioica* group was significantly lower than that in the control group.	None of the participants experienced any side effects from the medication.
13	(Shiralinezhad et al., 2022)	A double-blind randomized, clinical trial	106 women	In the intervention group, *Portulaca oleracea* capsules were taken twice a day, twelve hours apart, after taking mefenamic acid.	In the control group, placebo capsules that were similar in smell, color, and taste were administered at similar time intervals.	To measure postpartum bleeding, pads were weighed after each intervention.	The mean bleeding volume after the second intervention was observed in the intervention group and in the placebo group (p<0.001).	None of the participants experienced any side effects from the medication.
14	(Zahra et al., 2022)	A triple-blind randomized, clinical trial	105 pregnant women in the natural delivery ward of Umm al-Banin Hospital in Mashhad.	The intervention groups of 35 people received the first dose of 120 mg of *Planago major* rectal suppository and 290 mg of *Anetheum graveolens* rectal suppository immediately after the separation of the placenta and fetal membranes and uterine massage, and then subsequent doses were given every half hour up to 5 doses.	The 35 women in the control group underwent hospital procedures, and received 30 units of oxytocin after delivery.	PPH was measured by weighing blood bags and pads 4 hours after delivery.	A statistically significant difference was found in the mean blood loss at the end of the first 4 hours after delivery between the control group, the *Anetheum graveolens* group, and the *Planago* group (P = 0.001). The results showed that both *Anetheum graveolens* and *Planago major* rectal suppositories were effective in reducing PPH, but *Planago* rectal suppositories could reduce PPH more effectively.	None of the participants experienced any side effects from the medication.
15	(Niknami et al., 2023)	A randomized, clinical trial	98 women referred to the maternity ward of Al-Zahra Hospital in Rasht.	Two hours after delivery, 100 grams of date fruit was given to the intervention group, and the volume of bleeding was recorded in the first 24 hours.	No intervention.	The primary outcome was PPH, measured using the pictorial blood loss assessment chart.	The mean PPH in the date group and the control group was 35.0 and 39.0, respectively. Using the Hodges-Lehman estimator, the median PPH in the date group was 9.0 units lower than that in the control group (P=0.009).	Not reported.
16	(Heydari & Keshavarzynejad, 2023)	A randomized, clinical trial	110 mothers with natural childbirth.	The intervention group received sublingual drops of hydroalcoholic extract of the *Capsella bursa-pastoris* in addition to mefenamic acid 250 mg capsules.	The control group received sublingual placebo drops and mefenamic acid 250 mg capsules.	Labor pain was measured and recorded using a visual analogue scale every hour for the first 6 hours and then every 6 hours for the first 24 hours after delivery.	The volume of bleeding in the second and third hours was significantly lower in the intervention group (p=0.830).	Not reported.

Table 1. Continued

17	(Payranj et al., 2024)	A triple-blind randomized, clinical trial	72 women referred to the hospital for natural childbirth.	In addition to routine care, the intervention group received two sumac 500 mg capsules immediately after the placenta and membranes were separated and two hours later.	The placebo group received routine care.	Bleeding volume was measured using plastic bags to collect blood, which were weighed along with the sheets and pads used in 1, 2, 3, and 4 hours postpartum.	Patients receiving sumac showed significantly lower total mean blood loss in the first four hours after delivery compared with the placebo group ($p < 0.001$).	Not reported.
18	(Shayan et al., 2025)	A blind-blind parallel group randomized, clinical trial	Two hundred eligible multiparous women who went to Hamedan Maternity Hospital for natural childbirth.	Women were randomly divided into 3 groups of 50 subjects. In the experimental groups, in addition to routine care and oxytocin administration, mothers received a capsule containing 15 mg of dill seed extract or 20 mg of grape seed extract or 5 g of date extract immediately after delivery.	The control group (50 people) received usual care, oxytocin, and placebo.	Their bleeding volume was measured one and two hours after delivery.	The changes in bleeding in the placebo group at 1 and 2 hours postpartum were much less than that in the intervention groups, and the four groups were significantly different in terms of bleeding at both hours ($p < 0.001$). The overall difference between the date extract, the placebo, and grape seed groups was also statistically significant ($p < 0.05$).	

Note. PPH= Postpartum hemorrhage. MBL: Measured blood loss.

Results

The initial database search identified 222 records. After removing duplicates and irrelevant articles, 51 studies were screened, of which 18 clinical trials met the inclusion criteria and were included in this systematic review. A PRISMA flow diagram is presented in Figure 1. Among the included studies, 16 investigations evaluated herbal interventions following vaginal delivery, while 2 studies assessed their effects after cesarean section.

Several herbal medicines demonstrated beneficial effects on reducing postpartum hemorrhage (PPH). *Anethum graveolens* (Mahdavian et al. 2001; Shayan et al. 2025; Yousefi et al. 2021), Phoenix dactylifera (Khadem et al. 2007; Mojahed et al. 2012; Niknami et al. 2023; Sedighi-Khavidak et al. 2022), *Capsella bursa-pastoris* (Ghalandari et al., 2017; Ghalandari et al., 2016; Heydari & Keshavarzynejad, 2023), grape seed (Allahdadi, 2024; Izadpanah et al., 2018), and *Plantago major* (Nejati et al. 2018; Zahra et al. 2022) showed consistent reductions in postpartum bleeding compared with routine care or standard pharmacological treatments. Notably, *Anethum graveolens*, and *Phoenix dactylifera* were reported to be as effective as, or superior to, oxytocin in reducing PPH.

Traditional formulations such as the Tibetan medicine Zhi Byed 11 (ZB11) were less effective than misoprostol in preventing PPH; although, no significant differences were observed in severe blood loss (>1000 mL) (Miller et al. 2009). Chamomile (*Matricaria chamomilla*) demonstrated a trend toward reduced PPH; however, the difference was not statistically significant (Abedian et al. 2023; Abedian et al. 2016; Briggs et al. 2021).

Additional herbal agents, including *Portulaca oleracea* (Mirzaei et al. 2018; Ramezani Motlagh et al. 2019; Shobeiri et al. 2009), *Urtica dioica* (Eldamaty 2018; Franciškoviċ et al. 2017; Heydari et al. 2023; Hosseinpour Delavar et al. 2020; Khosroyar et al. 2018; Sourteji et al. 2013), and *Rhus coriaria* (BorazjaniZadeh 2017; Mehrabani Natanzi et al. 2016; Shabana et al. 2011) showed potential benefits in controlling uterine bleeding based on indirect or preclinical evidence, but direct clinical data in PPH were limited.

Following cesarean section, *Cuminum cyminum* L. (Fayaz et al. 2025; Rajabi et al. 2015) and Shenghua decoction (Chen et al. 2020; Fayaz et al. 2025; Wohling et al. 2019; Yu et al 2024) were associated with reduced postpartum bleeding and improved hematological indices when used alone or in combination with uterotonic agents.

Discussion

Postpartum hemorrhage (PPH) remains a primary cause of maternal mortality. Given the limitations of conventional chemical drugs such as adverse side effects and increasing resistance, alongside the historical use of herbal medicines in treating hemorrhage, this study systematically reviewed recent clinical trials.

The findings suggest that herbal medicines are a promising alternative for preventing and controlling PPH; although, definitive conclusions regarding their long-term efficacy require larger-scale studies. PPH remains a leading cause of maternal mortality worldwide, particularly in developing countries (Mirteimouri et al. 2020). While synthetic uterotonics like oxytocin are the gold standard for management, they are not without limitations. These agents are often associated with adverse side effects including cardiovascular complications such as hypertension and hypotension, nausea, vomiting, and water intoxication (Cunningham et al. 2014; Zeng et al. 2022). Furthermore, the need for cold chain storage and the potential for severe reactions with improper administration necessitate the exploration of safer alternatives. Given the historical significance of herbal medicine, this systematic review highlights the potential

of herbal medicines as effective agents for reducing PPH, offering a promising complementary strategy to conventional therapies (Gizzo et al. 2013).

Oxytocin, a high-alert medication, has undergone increased scrutiny due to potential risks. The Institute for Safe Medication Practices added it to a list of drugs requiring specific safeguards to minimize errors. Recently, in the United States, it has been used electively in most deliveries. Over the past two decades, its global use has been accompanied by monitoring of fetal heart rate and uterine contractions, which has made its use safer (Akbari et al. 2015; Jones et al. 2023).

The findings of this review suggest that several herbal medicines may significantly reduce postpartum blood loss, particularly following vaginal delivery. Herbal agents such as *Capsella bursa-pastoris, Phoenix dactylifera, Anethum graveolens,* grape seed, *Plantago major, Urtica dioica, and* Rutab dates consistently demonstrated beneficial effects, either alone or as adjuncts to oxytocin. These findings support the potential role of herbal medicines as complementary strategies to standard uterotonic therapy (Abedian et al. 2016; Bakhshalizadeh et al. 2022; Ghalandari et al. 2017; Ghalandari et al. 2016; Heydari et al. 2023; Hosseinpour Delavar et al. 2020; Izadpanah et al. 2018; Khojastehfard et al. 2019; Khosroyar et al. 2018; Mojahed et al. 2012; Nejati et al. 2018; Payranj et al. 2024; Shabana et al. 2011; Shayan et al. 2025; Shiralinezhad et al. 2022; Zahra et al. 2022).

The therapeutic effects of these herbal medicines are likely mediated by their bioactive constituents, particularly tannins and phenolic compounds. Tannins are known to induce smooth muscle contraction and exert astringent effects which directly enhance uterine tone and facilitate hemostasis. Furthermore, the antioxidant and anti-inflammatory properties of these compounds may support tissue recovery and mitigate secondary bleeding risks (Eldamaty 2018; Hosseinpour Delavar et al. 2020; Khosroyar et al. 2018; Mahdavian et al. 2001).

Several studies demonstrated that the concurrent use of herbal medicines with oxytocin resulted in greater reductions in PPH compared with oxytocin alone, suggesting a potential synergistic effect (Ghalandari et al. 2017; Ghalandari et al. 2016; Hosseinpour Delavar et al. 2020; Izadpanah et al. 2018; Khojastehfard et al. 2019; Shabana et al. 2011; Eldamaty 2018; Khosroyar et al. 2018; Mahdavian et al. 2001). This is clinically relevant, as complete omission of oxytocin—especially in high-risk women—may lead to severe complications (Sheikh et al. 2011). Therefore, herbal medicines should be considered adjuncts rather than replacements for standard uterotonic agents, particularly in cesarean deliveries or high-risk cases (Fazel et al. 2013; Khosroyar et al. 2018; Li et al. 2022; Mirteimouri et al. 2020; Yu et al. 2024).

Another critical consideration in the use of herbal medicines is their potential side effects. For instance, Abedian et al. in a study of 70 multiparous women, reported one case of nausea and vomiting in the mefenamic acid group and two cases of drowsiness in the chamomile group (Abedian et al. 2016). Similarly, Yu et al. observed side effects including facial flushing, headache, dizziness, diarrhea, shivering, fever, nausea, vomiting, and fainting in both control and intervention groups among participants receiving Shenghua decoction alongside carbetocin (Yu et al. 2024). In another study, Ghalandari et al. reported one case of throat pain and itching in the sublingual *Capsella bursa-pastoris* group and nausea in the placebo group among 100 postpartum women (Ghalandari et al. 2017). These findings underscore the importance of monitoring and reporting of adverse effects associated with herbal medicines.

One of the strengths of the present study is its comprehensive review of herbal medicines used to manage PPH following

both vaginal and cesarean deliveries. However, a key limitation is the inability to perform a meta-analysis due to the heterogeneity of the herbal interventions studied and various tools used to measure bleeding across studies.

Given the global rise in the use of herbal products, it is important to note that while herbal medicines generally have fewer side effects than conventional drugs, their use still requires careful consideration. The findings of the reviewed studies highlight the potential effectiveness of various herbal medicines in preventing and controlling PPH—one of the most critical complications of childbirth.

The present study has several limitations that should be acknowledged. First, the primary studies included in this review exhibited considerable heterogeneity in terms of the types of herbal medicines used, dosages, administration routes, and outcome measures. This diversity precluded the possibility of performing a meta-analysis and limited our ability to provide a pooled quantitative estimate of the effect. Second, despite a comprehensive search strategy, there is a potential for publication bias and language bias, as we restricted our search to articles published in English and Persian. Third, some of the included studies had small sample sizes and unclear or high risk of bias in specific domains such as blinding of participants and personnel, which may have affected the reliability of the reported results.

The findings of this systematic review suggest that certain herbal medicines may have potential benefits in reducing PPH. These results could be applied in clinical practice as complementary options, particularly in resource-limited settings where conventional uterotonic agents may be unavailable. However, clinical application must be approached with caution. Given the heterogeneity of the interventions and the varying quality of the included trials, herbal medicines should not replace standard oxytocics in emergencies.

This study was conducted using the most recent research findings on the use of herbal medicines to control PPH following both vaginal and cesarean deliveries in Iran and other countries. The reviewed evidence suggests that herbal medicines—used alone or in combination with oxytocin—can effectively reduce the amount and severity of PPH. The concurrent use of herbal and pharmaceutical agents may also help lower the required doses of synthetic drugs, thereby potentially reducing associated side effects. Therefore, further large-scale, well-designed clinical trials are recommended to evaluate the efficacy and safety of these herbal medicines in the prevention and management of PPH.

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Conflicts of interest

The authors had no competing interests.

Ethical Considerations

The study was approved by the Ethics Committee of Mashhad University of Medical Sciences

Code of Ethics

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Authors' Contributions

Conception and design: MR and FZK.

Data acquisition, interpretation of data: All authors. Critical revision of the manuscript: All authors

Abbreviations

PPH: Postpartum hemorrhage
MBL: Measured blood loss

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