Complementary Therapies in Medicine 44 (2019) 27–31

Contents lists available at ScienceDirect

Complementary Therapies in Medicine

journal homepage: www.elsevier.com/locate/ctim

"Evaluation of the effect of roasted lentil flour (lentil *savigh*) as a functional food in menstrual bleeding reduction"

Malihe Shafiee[a], Akram Heidari[b], Hora Amouzegar[c], Samira Khani[d], Fatemeh Nojavan[a,*]

[a] Department of Iranian Traditional Medicine, School of Medicine, Qom University of Medical Sciences, Qom, 00982537764080, Iran
[b] Spiritual Health Research Center, Qom University of Medical Sciences, Qom, 00982537764080, Iran
[c] Department of Obstetrics and Gynecology, School of Medicine, Qom University of Medical Sciences, Qom, 00982537706470, Iran
[d] Neuroscience Research Center, Qom University of Medical Sciences, Qom, 00982537706470, Iran

ARTICLE INFO

Keywords:
Menorrhagia
Lentil *savigh*
Tranexamic acid
Complementary medicine

ABSTRACT

Background: Menorrhagia is a regular menstrual cycle lasting more than seven days and/or blood loss over 80 mL per cycle. One of the herbs recommended in Iranian traditional medicine for menorrhagia treatment is lentil *savigh,* which is the flour made from roasted lentil (*Lens culinaris medic*).

Methods: The current randomized clinical trial was conducted on 54 patients within the age range of 18 to 50 years randomly divided into two groups. The treatment group took three 10-gram lentil *savigh* sachets in the morning. The control group was treated with 500 mg tranexamic acid capsule every eight hours, both from the first day of menstruation for seven days. Patient's bleeding was evaluated by the pictorial blood loss assessment chart (PBAC), before and in each of the three treatment cycles. Quality of life was evaluated by the menorrhagia questionnaire (MQ) at the beginning and the end of the study for each patient.

Results: The mean (SD) of PBAC scores significantly decreased before and after three cycles from 383.5(163) to 222.1(128.6) in the lentil *savigh* group ($P < 0.0001$), and from 333.8(141.3) to 239.1(132.6) in the tranexamic acid group ($P < 0.0001$). There was no significant difference between the two groups ($P < 0.6$).

Quality of life significantly improved in the lentil *savigh* group from 61.5(12.3) to 34.4(14.6) in comparison with that of the tranexamic acid group changing from 56.3(11.1) to 46.8(12.7) ($P < 0.004$).

Conclusion: Both products were effective in menstrual bleeding reduction, but lentil *savigh* improved the quality of life more effectively. Therefore, lentil *savigh*, as a functional food, could be introduced as a good initial choice for menorrhagia treatment.

1. Introduction

Menorrhagia is a heavy prolonged uterine bleeding occurring in short or regular cycles, and is prevalent among women.[1] Normal menstrual cycles in women are 3–6 days and the amount of normal bleeding is 35–80 mL per cycle.[2] Menorrhagia is clinically defined as a regular menstrual cycle lasting more than 7 days and/or losing blood over 80 mL per cycle.[3] Menorrhagia is caused by systemic and topical factors or surgery and medication.[2,4] But there are no pathological causes in 50% of women with menorrhagia.[5]

Abnormal uterine bleeding (AUB) is estimated to involve 11–13% of the general population and increases to 24% at the age of 36–40.[6] Besides, it is one of the common reasons that women visit doctors at reproductive age and comprises 20% of gynecology visits.[7,8]

Menstrual bleeding causes negative feelings and limits social and professional activities. This subject is more severe in women with heavy menstrual bleeding (HMB) and worsens the quality of life compared to those with normal bleeding.[9]

HMB also causes physical weakness and anemia, and is associated with lower quality of life.[10,11] As a result, menorrhagia is a serious problem for a lot of women reaching the highest level at premenopause age.[12]

Common therapies used to treat this disease are categorized as follows: oral medication, intrauterine devices, and surgical methods. Oral medications are divided into hormonal and non-hormonal groups. Non-hormonal medications include NSAIDs (nonsteroidal anti-inflammatory drugs- i e, mefenamic acid)-and antifibrinolytics- i e, tranexamic acid, which have gastrointestinal side effects.[2,13]

Hormonal drugs cause many side effects such as weight gain, breast tenderness, headaches, thrombotic events, skin problems- i e, acne,

* Corresponding author.
E-mail addresses: sv.shafiey@gmail.com (M. Shafiee), heidariama@gmail.com (A. Heidari), amuzegarhoora@gmail.com (H. Amouzegar), pharma_75@yahoo.com (S. Khani), fnojavan@muq.ac.ir (F. Nojavan).

https://doi.org/10.1016/j.ctim.2019.03.010
Received 24 December 2018; Received in revised form 15 March 2019; Accepted 15 March 2019
Available online 18 March 2019
0965-2299/

increased bone demineralization rate, and menopausal complications, such as vaginal dryness and hot flushes for the patient, and is only prescribed for short periods.[13,14] On the other hand, AUB is responsible for about two-thirds of all hysterectomies in women and the complications of surgery increase the risk of morbidity and mortality and impose a high cost on the health system.[7,13]

In different countries and cultures, complementary and traditional therapies are used to treat menorrhagia. Iranian traditional medicine —which is one of the oldest and richest complementary and alternative medicine schools— is effective and associated with low complications.[15]

In Iranian traditional medicine resources, heavy menstrual bleeding is referred to as *Efrat-e-Tams*[16] and, treatment of menorrhagia is divided into two general categories of medicinal and non-medicinal. The latter is mentioned as the first-line treatment, which includes lifestyle modifications, special food consumption and cupping therapy.[15] Lentil is one of the herbs recommended in Iranian traditional medicine to treat menorrhagia.[16] Lentil *savigh* is the flour made from roasted lentil. Based on Iranian traditional medicine resources, the properties of *savigh* is similar to those of the material from which it is made, with a more astringent property. As a result, properties and benefits of lentil *savigh* are similar to those of lentil.[17] Lentil is a kind of legumes containing significant amounts of macronutrients and micronutrients, high levels of protein, soluble and insoluble fibers and prebiotic carbohydrates, minerals (e g, Ca, Fe, Mg, P, K, Na, Zn, Cu, Mn, and Se), high levels of antioxidants and phytoestrogen. It also contains some types of vitamins (e g, A, thiamine, riboflavin, folate, niacin, pantothenic acid, pyridoxine, β-carotene, K, E) and herbal nutrients (flavonoids, tannins, phytic acid).[18,19]

Today, the effect of lentil on the prevention and treatment of certain diseases is proven. For example, it controls type II diabetes mellitus,[20,21] improves iron levels in patients with anemia,[22] decreases risk of cardiovascular disease, decreases serum levels of low-density lipoprotein (LDL) in people with high cholesterol,[23] is effective in preventing various cancers including prostate, lung, colorectal, bladder, and various gastrointestinal cancers due to significant amounts of Se.[24] Lentil is abundant and accessible. Also, no specific side effect has been reported so far for this legume. Therefore, the consumption of lentil *savigh* due to greater astringent power, as well as being a food, can be as effective as the first-line treatment for menorrhagia or supplementary method for the pharmaceutical treatment in severe cases.

2. Material and method

2.1. Study design and participants

The current randomized clinical trial was conducted on 54 patients attending Iranian Traditional Medicine Department of Zafar Clinic and Obstetric and Gynecology Clinic of Izadi Hospital in Qom, Iran from January 2018 to July 2018. A total of 140 patients were initially screened based on the inclusion and exclusion criteria. Among the patients, 54 cases were eligible for the trial.

Inclusion criteria in the current study consisted of women within the age range of 18–50 years, with a PBAC score of over 100, willing to participate in the study, signing a written consent form, having body mass index (BMI) of 18.5-29.5 kg/m^2, normal pap smear, having hemoglobin level > 10 g/dL, absence of systemic diseases (thyroid, coagulation disorders), not using any effective medications for menstrual bleeding (i e, contraceptive pills, acetylsalicylic acid), absence of uterine fibroids larger than 3 cm, and absence of pathological or uterine causes for abnormal uterine bleeding. On the other hand, pregnant women, patients who did not wish to continue treatment for any reasons, those who required special treatment due to complications (i e, anemia), the ones who needed surgery or an emergency measure due to increased bleeding during the study, or needed any hormonal medication or contraceptives were excluded.

The sample size in this study is based on the findings of Memarzade and colleagues[25] where an $\alpha = 5.00\%$ and $\beta = 20.00\%$, 22 subjects per group were considered.

Group randomization was performed using block randomization method; therefore, four blocks were used for grouping. Sampling continued until the completion of sample size.

2.2. Ethics requirements

The study objectives and the procedure were explained to all the participants who were willing to participate in the project. The study protocol was approved by the Ethics Committee of Qom University of Medical Sciences (ethical code: IR.MUQ.REC.1396.43). Besides, the study was also registered at the Iranian Registry for Clinical Trials (No. IRCT2017072935363N1).

2.3. Lentil savigh preparation

The required lentil was collected from Natanz, Isfahan Province, Iran in 2017; some plant samples were delivered to the Herbarium Center of the Faculty of Pharmacy, University of Tehran. The scientific name of the collected specimen is *Lens culinaris Medic* belonging to *Leguminosae* family with the herbarium number PMP-1701.

The lentil *savigh* was prepared by the Bouali Daru Pharmaceutical Company. The method of preparing lentil *savigh* was based on Kholasat-al-Hekmah book by Aghili Khorasani, one of the major references of Iranian traditional medicine.[26] First, the lentils were roasted by gentle heating for 45 min to such an extent that became neither raw nor burned. Then the roasted lentils were washed once with warm water and once with cold water. After that, they were completely dried and ground.

2.4. Phytochemical screening

Lentil *savigh* powder was analyzed for the total Phenolic content by the Folin–Ciocalteu colorimetric method using Gallic Acid as standard[27] and the hydrolyzed tannin content was examined by the permanganate index.[28] The content of total phenolics and tannin was expressed as mg of gallic acid equivalents (GAE)/g of Lentil *Savigh* powder.

Finally, a total of twenty-one numerically packed 10-g lentil *savigh* sachets were prepared and given to the patients for one period of menstruation.

2.5. Intervention study

Before the study onset, all of the patients willing to participate in the study and had a PBAC score of over 100 were evaluated. They underwent a transvaginal ultrasound, Pap smear examination, and essential tests including CBC, PT, PTT, prolactin, and TSH to examine the pathological causes of menorrhagia. In cases with absence of pathologic cause, patients were diagnosed with idiopathic menorrhagia and thus were studied.

After the first and the control cycle, patients were randomly divided into two groups for treatment. The intervention group was treated with lentil *savigh*, using three 10-g sachets in the morning from the first day of menstruation for seven days. The control group was treated with 500-mg tranexamic acid capsules (250 mg capsule, Amin Pharmaceutical Company, Isfahan, Iran) every eight hours from the first day of menstruation for seven days. Both groups received treatment for three consecutive cycles. Also, patients were asked not to use hormonal drugs, herbal medicines, and mefenamic acid during the treatment period.

2.6. Data collection instruments

Patient bleeding was evaluated by the pictorial blood loss

assessment chart (PBAC). This graphic chart is a table that its row shows the number of menstrual days and column shows soiling pads at three degrees including mild, moderate, and severe. When the PBAC score is 100 or more, the volume of menstrual bleeding is ≥80 mL. PBAC is a valid instrument with a sensitivity of 86% and a specificity of 89%. It can be an effective method to diagnose menorrhagia.[29,30] The patients filled in the form mentioned above for a period before taking the drug and in each of the three treatment cycles for comparison with the first period.

The Iranian version of the menorrhagia questionnaire (MQ) was completed in the beginning of the study and at the end of three therapeutic cycles for each patient to evaluate the quality of life. This questionnaire includes 13 specific questions regarding the status of menstrual bleeding in female subjects[31]. The reliability and validity of MQ developed by Ruta and Garrat (1996) has been confirmed in several studies.[32]

2.7. Statistical analysis

Data were analyzed with SPSS version 20. First, the normal distribution of data in the beginning of the study was investigated by the Kolmogorov-Smirnov test. To explain the statistical results, descriptive characteristics such as mean and standard deviation were used. To compare the PBAC and MQ scores as well as Hb levels between the two groups, independent *t*-test and the Mann-Whitney test were used. Paired samples *t*-test was used to compare each of the parameters in each group before and after the treatment. To describe the data, $P < 0.005$ was considered significant.

3. Result

3.1. Contents of total phenocs and tannin in lentil savigh

The contents of total phenolics and tannin were 2.8 mg GAE /g powder and 15 mg GAE /g powder in lentil *savigh*, respectively.

3.2. Clinical trial results

Totally, 140 patients were evaluated in this study, 44 of whom did not meet the inclusion criteria, 23 refused to participate, and 19 did not attend the next steps. Finally, 54 subjects were randomly divided into two groups, 26 were treated by lentil *savigh* and 28 by tranexamic acid.

In the lentil *savigh* group, four subjects were excluded: one due to pregnancy, one due to dissatisfaction with the treatment, one due to spinal surgery, and one due to improper use of the drug. In the tranexamic acid group, six subjects were excluded: two due to non-cooperation and improper use of the drug, three due to discontent with the treatment, and one due to acute renal failure during the treatment. Eventually, 22 participants in each group completed the project and their data were analyzed (Fig. 1).

The basic characteristics of the participants in the study are described in Table 1.

There was no significant difference between the two groups at baseline.

Inter- and intragroup comparisons in terms of the amount of menstrual bleeding were performed between the intervention (Lentil *savigh*) and control (Tranexamic acid) groups before and after the treatment.

The mean (SD) of PBAC scores significantly decreased in both groups after the treatment compared to baseline ($P = 0.0001$), but there was no significant difference between the two groups (Table 2).

There was a significant difference in MQ scores in the lentil *savigh* group before and after treatment which indicates an improvement in the quality of life after treatment ($P = 0.0001$). In the tranexamic acid group, the decline in MQ scores indicated improvement ($P = 0.0001$). There was a significant difference between the two groups ($P = 0.004$).

The comparison between the two groups showed that the quality of life was better in the lentil *savigh* group than the tranexamic acid group (Table 3).

4. Discussion

The current study was the first randomized clinical trial on the effect of lentil *savigh* as a nutritional supplement (and not a drug) by comparing it with the effect of tranexamic acid on heavy menstrual bleeding. It showed that consuming 30 g of lentil *savigh* for seven days from the first day of menstruation significantly reduced the amount of menstrual bleeding. It also significantly improved the quality of life in the intervention compared to the tranexamic acid group.

In conclusion, results of the current study showed that the use of lentil *savigh* compared to tranexamic acid was a safe and effective treatment without a particular side-effect. In Iranian traditional medicine, the therapeutic effect of a drug cannot be definitely attributed to a particular agent. Since no study has examined the properties of lentil savigh so far, it is not possible to ascribe the therapeutic effect of this product to one of its specific components. But the current study could be a foundation for further investigations.

According to previous studies, prostaglandins are synthesized in the endometrium more than normal in the luteal phase of the menstrual cycle in idiopathic menorrhagia. These prostaglandins (e g, PE2) are vasodilators that lead to the increased uterine bleeding.[33,34]

Besides, in this phase, some inflammatory factors lead to endometrium edema. For example, leukocyte migration causes microerosion at the endometrium epithelial. This inflammation is known as one of the causes of abnormal uterine bleeding. On the other hand, inflammatory macrophages and natural killer (NK) cells secrete inflammatory vasodilators that cause damage to the epithelial capillary and, in turn, increase bleeding.[35]

Based on the results of previous investigations, lentils have high antioxidant activity, high amount of phytoestrogen, a variety of vitamins such as K, and herbal nutrients such as flavonoids, tannin, and phytic acid. Some of these are effective on controlling menstrual bleeding.[18,19]

According to previous studies, lentils contain significant amounts of tannin and vitamin k, both of which play an important role in controlling the amount of bleeding.[36,37]

The drugs containing tannin are commonly used as astringent medications. Tannin has styptic properties and can cause endothelium capillary contractions. As a result, it can reduce menstrual bleeding.[38] Vitamin k is also used to control bleeding. It should be noted that lentils are a variety of foods that should be taken with caution in people taking warfarin.[39] On the other hand, the consumption of lentils inhibits COX2 and PGE2.[40]

Furthermore, based on background studies, flavonoid suppresses the endometrial prostaglandins and inhibits inflammatory mediators. Therefore, it is effective in treating abnormal uterine bleeding.[41]

As a result, it seems that the lentil *savigh* reduces menstrual bleeding due to its inhibitory effect on the inflammatory cells and mediators as well as the astringent property of tannin. Numerous studies have been conducted on the effect of herbal medicines on uterine bleeding. However, despite the employment of this product as a treatment for menorrhagia in Iranian traditional medicine, no study has been carried out to assess its effect on this subject.[42] The current study evaluated the effect of lentil as a foodstuff with a particular preparation method on the treatment of menorrhagia. Finally, the effectiveness of lentil savigh was proved.

Since lentils are cost-effective and easy-to-access foodstuff typically found in the family's food basket, they can be used as the first-line treatment for menorrhagia. On the other hand, according to the Iranian traditional medicine and modern medicine, there is no contraindication for the consumption of lentils during pregnancy and breastfeeding. Thus, lentils can be used in bleeding during pregnancy and postpartum hemorrhage as a nutritional supplement.

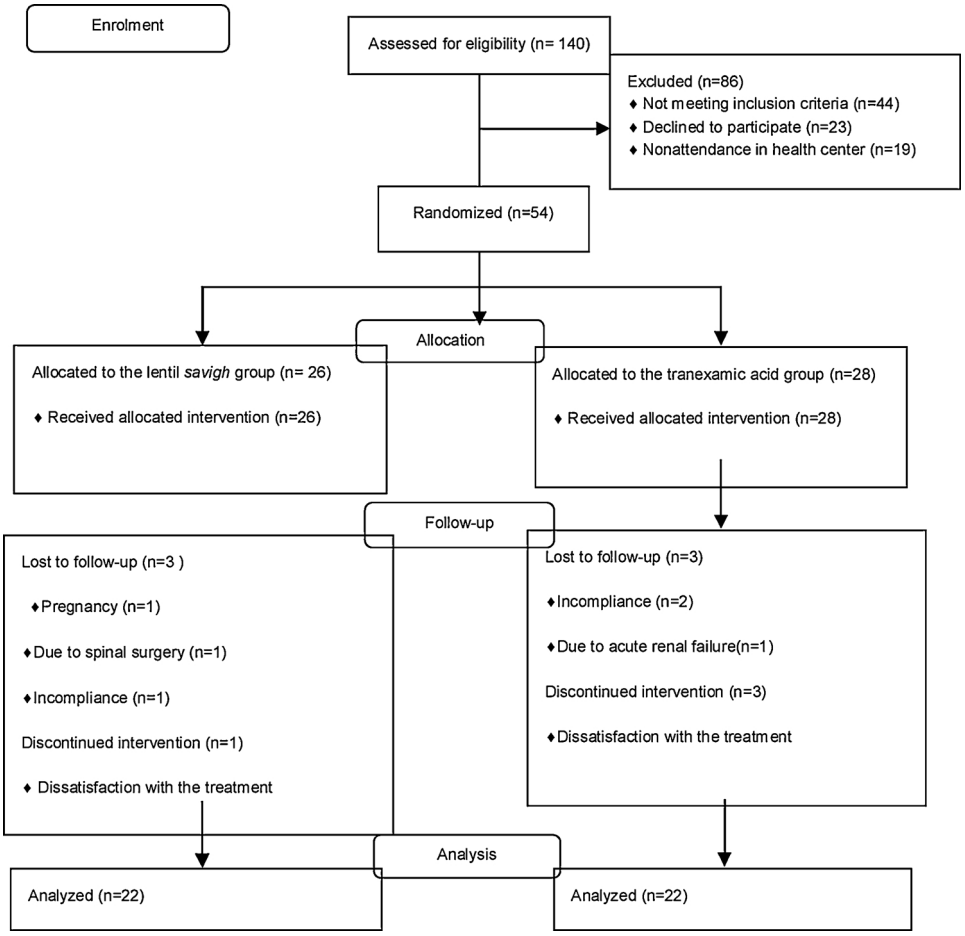

Fig. 1. Study flowchart.

Table 1
Basic Characteristics of Participants According to Groups.

Characteristic	Lentil *savigh* (n = 22)	Tranexamic acid (n = 22)	P-value
Age	38.9(6.1)[a]	35.1(8.8)	0.1[b]
BMI	26.1(2.8)	24.7(2.9)	0.1[b]

[a] Mean (standard deviation).
[b] Student's *t*-test for Independent Samples.

Table 2
Comparison of PBAC Scores Before and After Treatment.

Time/ PBAC Score	Lentil *savigh* (n = 22)	Tranexamic acid (n = 22)	P-value [b]
Before intervention	383.5(163.0) [a]	338.8(141.3)	0.28
After 1 month	252.5(115.7)	238.5(126.8)	0.7
After 2 month	212.8(111.2)	244.5(124.4)	0.3
After 3 month	222.1(128.6)	239.1(132.6)	0.6

[a] Mean (standard deviation).
[b] Student's *t*-test for Independent Samples.

4.1. Limiting

Small sample size, a short period of follow-up, and lack of blinding in the two groups were the limitations of the study. It is suggested to perform further studies with larger sample sizes in longer periods. It is also possible to study the different doses of lentil *savigh* to find appropriate doses, as well as other species of lentil to test their effectiveness.

Table 3
Comparison of MQ Scores Before and After Intervention.

Time/MQ Score	Lentil *savigh* (n = 22)	Tranexamic acid (n = 22)	P-value [b]
Before intervention	61.5(12.3) [a]	56.3(11.1)	0.1
After 3rd cycles	34.4(14.6)	46.8(12.7)	0.004

[a] Mean (standard deviation).
[b] Student's *t*-test for Independent Samples.

5. Conclusion

Both products were very effective in reducing the menstrual bleeding according to PBAC scores. However, the consumption of lentil savigh was more effective in the improvement of the quality of life in comparison with tranexamic acid. As a result, "lentil *savigh*" can be introduced as a good first-line choice for the treatment of menorrhagia.

Authors

All research has been done by the authors.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

The current study was part of a PhD dissertation in Iranian

traditional medicine. The authors greatly thank Qom University of Medical Science and affiliated centers for their cooperation to complete the study.

References

1. Fritz M, Speroff L. *Clinical gynecology and infertility*. 8th ed. 2011; 2011 Philadelphia.
2. Marret H, Fauconnier A, Chabbert-Buffet N, et al. Clinical practice guidelines on menorrhagia: management of abnormal uterine bleeding before menopause. *Eur J Obstet Gynecol Reprod Biol.* 2010;152(2):133–137. https://doi.org/10.1016/j.ejogrb.2010.07.016.
3. Toxqui L, Perez-Granados AM, Blanco-Rojo R, Wright I, Vaquero MP. A simple and feasible questionnaire to estimate menstrual blood loss: relationship with hematological and gynecological parameters in young women. *BMC Women Health.* 2014;14(71) https://doi.org/10.1186/1472-6874-14-71.
4. Hurskainen R, Grenman S, Komi I, et al. Diagnosis and treatment of menorrhagia. *Acta Obstet Gynecol Scand.* 2007;86(6):749–757.
5. Elsheikh E, Andersson E, Sylvan C, Ericzon BG, Palmblad J, Mints M. Plasma levels of stromal cell-derived factor-1 (CXCL12) and circulating endothelial progenitor cells in women with idiopathic heavy menstrual bleeding. *Hum Reprod.* 2014;22(1):49–56. https://doi.org/10.1093/humrep/det402.
6. Qaraaty M, Kamali SH, Dabaghian FH, et al. Effect of myrtle fruit syrup on abnormal uterine bleeding: a randomized double-blind, placebo-controlled pilot study. *Daru.* 2014;22(1):1. https://doi.org/10.1186/2008-2231-22-45.
7. Oehler MK, Rees MCP. Menorrhagia: an update. *Acta Obstet Gynecol Scand Supple.* 2003;82(5):405–422. https://doi.org/10.1034/j.1600-0412.2003.00097.x.
8. Munro MG, Critchley HO, Fraster IS. The FIGO systems for nomenclature and classification of causes of abnormal uterine bleeding in the reproductive years: who needs them? *Am J Obstet Gynecol.* 2012;207(4):259–265. https://doi.org/10.1016/j.ajog.2012.01.046.
9. Karlsson TS, Marions LB, Edlund MG. Heavy menstrual bleeding significantly affects quality of life. *Acta Obstet Gynecol Scand.* 2014;93(1):52–57. https://doi.org/10.1111/aogs.12292.
10. Azizkhani M, Vahid Dastjerdi M, Tabaraee M, et al. Traditional dry cupping therapy versus medroxyprogesterone acetate in the treatment of idiopathic menorrhagia: a randomized controlled trial. *Iran Red Crescent Med J.* 2018;20(2) https://doi.org/10.5812/ircmj.60508 e60508.
11. Rahi P, Mirghafourvand M, Mohammad-Alizadeh-Charandabi S, Javadzadeh Y, Seidi S. Comparison of the effect of mefenamic acid and quince on the level of menstrual bleeding and hemoglobin: a randomized controlled clinical trial. *EUJIM.* 2016;8(1):67–72. https://doi.org/10.1016/j.eujim.2015.11.022.
12. Duckitt K. Managing perimenopausal menorrhagia. *Maturitas.* 2010;66(3):251–256. https://doi.org/10.1016/j.maturitas.2010.03.013.
13. Protheroe J. Modern management of menorrhagia. *J Fam Plann Reprod Health Care.* 2004;30(2):118–122.
14. Bahman M, Mirahi A, Hajimehdipoor H, Tansaz M. The effect of Quince paste on menorrhagia: a clinical study. *Int J Pharm Sci Res.* 2018;9(4):1654–1659.
15. Tansaz M, Memarzadehzavareh H, Qaraaty M, Eftekhar T, Tabarrai M, Kamalinejad M. Menorrhagia management in Iranian traditional medicine. *J Evid Based Complement Altern Med.* 2016;21(1):71–76. https://doi.org/10.1177/2156587215589522.
16. Mobli M, Qaraaty M, Gh Amin, Haririan I, Hajimahmoodi M, Rahimi R. Scientific evaluation of medicinal plants used for the treatment of abnormal uterine bleeding by Avicenna. *Arch Gynecol Obstet.* 2015;292(1):21–35. https://doi.org/10.1007/s00404-o15-3629-x.
17. Shafiee M, Nojavan F. Therapeutic effects of roasted lentil flour from the viewpoint of Iranian Islamic resources: a review. *Health Spirit Med Ethics.* 2018;5(4):53–58.
18. Thavarajah P, Wejesuriya A, Rutzke M, Glahn RP, Combs JGF, Vandenberg A. The potential of lentil (Lens culinaris L.) as a whole food for increased selenium, iron, and zinc intake: preliminary results from a 3-year study. *Euphytica.* 2011;180(1):123–128. https://doi.org/10.1007/s10681-011-0365-6.
19. Johnson CR, Combs GF, Thavarajah P. Lentil (Lens culinaris L.): a prebiotic-rich whole food legume. *Food Res Int.* 2013;51(1):107–113. https://doi.org/10.1016/j.foodres.2012.11.025.
20. Anoma A, Collins R, McNeil D. The value of enhancing nutrient bioavailability of lentils: the Sri Lankan scenario. *Afr J Food Agric Nutr Dev.* 2014;14(7):9529–9543.
21. Abadi A, Tahbaz F, Entezari MH, Shams H. Study of the effect of baked lentil on glycemic control and lipid profiles in type ll diabetics. *J Sabzevar Univ Med Sci.* 2008;15(2):98–103 [Persian].
22. Migliozzi M, Thavarajah D, Thavarajah P, Smith P. Lentil and Kale: complementary nutrient-rich whole food sources to combat micronutrient and calorie malnutrition. *Nutrients.* 2015;7(11):9285–9298. https://doi.org/10.3390/nu7115471.
23. Taylor C. *Lentils as a functional food to improve glucose and decrease cardiovascular risk (LEN-0-2012)*. U. S. National library of medicine; 2016https://clinicaltrials.gov/ct2/show/NCT01562171.
24. Ates D, Sever T, Aldemir S, et al. Identification QTLs controlling genes for se uptake in lentil seeds. *PLoS One.* 2016;11(3) https://doi.org/10.1371/journal.pone.0149210 e0149210.
25. Memarzadeh H, Eftekhar T, Tansaz M, et al. Evaluation of efficacy of Punica granatum L.(Persian gulnar) on uterine leiomyoma related menorrhagia: a pilot study. *Int J Biosci.* 2015;6(9):18–25. https://doi.org/10.12692/ijb/6.9.18-25.
26. kholasatolhekmat Aghilikhorasani M. Qom. *Esmailian.* 2006 P:212.
27. Nickavar B, Esbati N. Evaluation of the antioxidant capacity and phenolic content of three thymus species. *J Acupunct Meridian Stud.* 2012;5(3):119–125.
28. Bryan-Thomas J. A comparative study of the antioxidant activity (DPPH), total flavonoid, total tannin, total polyphenol levels in plant extracts of the Annona muricata, Ribes nigrum and Manilkara zapota. *Int J Sci Res Publ.* 2016;6(9):490–493.
29. Chianeh YR, Kamath U, Rao P. Use of pictorial blood loss assessment chart to investigate a severity of blood loss among women with heavy menstrual bleeding. *Adv Biores.* 2017;8:18–25. https://doi.org/10.1016/j.jmig.2014.01.015.
30. Hald K, Lieng M. Assessment of periodic blood loss: interindividual and intraindividual variations of pictorial blood loss assessment chart registrations. *J Minim Invasive Gynecol.* 2014;21(4):662–668. https://doi.org/10.1016/J.jmig.2014.01.015.
31. Mazari Z, Ghoshtasbi A, Mukhah S, Saki F. The menorrhagia questionnaire (MQ): translation and validation study of the Iranian version. *Payesh.* 2012;11(1):83–88.
32. Ruta D, Garrat A, Chadha Y, Flett G, Hall M, Russell. Assessment of patients with menorrhagia: how valid is structured clinical history as a measure of health status? *Qual Life Res.* 1995;4(1):33–40. https://doi.org/10.1007/BF00434381.
33. Berbic M, Ng C, Fraser I. Inflammation and endometrial bleeding. *Climacteric.* 2014;17:47–53. https://doi.org/10.3109/13697137.2014.963964.
34. Livshits A, Seidman DS. Role of non-steroidal anti-inflammatory drugs in gynecology. *Pharmaceuticals.* 2010;3(7):2082–2089. https://doi.org/10.3390/ph3072082.
35. Shivhare SB, Bulmer JN, Innes BA, Hapangama DK, Lash GE. Menstrual cycle distribution of uterine natural killer cells is altered in heavy menstrual bleeding. *J Reprod Immunol.* 2015;112:88–94. https://doi.org/10.1016/j.jri.2015.09.001.
36. Vaillancourt R, Slinkard A, Reichert R. The inheritance of condensed tannin concentration in lentil. *Can J Plant Sci.* 1986;66(2):241–246. https://doi.org/10.4141/cjps86-038.
37. Dirk D, Menandros L, Yolande H. Clinical problem solving- "a headache ". *Oman Med J.* 2000;17(2):62–65.
38. Fatima A, Sultana A. Clinical efficacy of Unani formulation' Safoof Habis' in menorrhagia: a randomized controlled trial. *EUJIM.* 2012;4:315–322. https://doi.org/10.1016/j.eujim.2012.01.007.
39. Linda N. Balancing anticoagulant therapy. *Geriatr Nurs (Minneap).* 1991:15–17.
40. Zia-Ul-Haq M, Landa P, Kutil Z, Qayum M, Ahmad S. Evaluation of anti-inflammatory activity of selected Legumes from Pakistan: in vitro inhibition of cyclooxygenase-2. *Pak J Pharm Sci.* 2013;26:185–187.
41. Mukherjee GG, Gajaraj AJ, Mathias D, Marya D. Treatment of abnormal uterine bleeding with micronized flavonoids. *Int J Gynecol Obstet.* 2005;89(2):156–157. https://doi.org/10.1016/j.ijgo.2004.11.032.
42. Javan R, Yousefi M, Nazari SM, et al. Herbal medicines in idiopathic heavy menstrual bleeding: a systematic review. *Phytother Res.* 2016;30(10):1584–1591. https://doi.org/10.1002/ptr.5675.