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Research Article

### THE EFFECT OF PERSIAN MEDICINE EATING AND DRINKING MODIFICATIONS ON FUNCTIONAL BLOATING: A SINGLE ARM STUDY.

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#### Abstract:

**Background:** Functional bloating is a common gastrointestinal (GI) symptom, for which a variety of treatments have been suggested, including quality of life modifications.

**Objectives:** Previous studies have demonstrated the efficacy of quality of life changes on functional bloating, but the effect of Persian medicine modifications on functional bloating is yet to be studied.

**Methods:** This single arm study was performed at the GI clinic of Shahid Mostafa Khomeini Hospital. Thirty-five (35) of the assessed patients satisfied the inclusion criteria and entered the study. Patients' digestive symptoms were measured using the Rome III criteria and the quality of their symptoms was assessed by a 5-point Likert scale questionnaire. Thereafter, Persian medicine food and drinking modifications were taught to patients and they were followed every week; their symptoms were reassessed at the end of each week.

**Results:** At the end of the treatment period, the assessment of bloating and belching in patients who participated in the study showed that eating and drinking interventions caused a significant difference in the rate of bloating ( $P < 0.001$ ) and belching ( $P < 0.001$ ) before and after the study and both recorded a decrease.

**Conclusions:** The results of this study showed that Persian medicine eating and drinking modifications are effective in terms of reducing the severity of functional bloating.

**Key words:** Functional Gastrointestinal Disorders, Bloating, life style, Iranian Traditional Medicine.

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**INTRODUCTION:****Background**

Bloating is among the gastrointestinal (GI) symptoms affecting 10 to 30% of the healthy population. This symptom inconveniences patients and affects their quality of life. Functional bloating is defined as abdominal bloating or noticeable abdominal distension which occurs at least 3 days a month in the last 3 months, with sufficient criteria to rule out irritable bowel syndrome, functional dyspepsia, or other functional GI disorders (1-3).

Several causes have been evaluated and suggested for bloating but the exact pathology is yet to be identified. For this reason, its effective treatment is still under discussion. Various drugs have been considered for the treatment of bloating, including antibiotics, probiotics, opioids, and antidepressants. However, the effectiveness of these drugs vs. their complications has encouraged researchers to consider other drugs (4-7).

In order to treat bloating, non-medical methods have been studied. These methods include lifestyle changes such as certain diets, weight loss and abdominal exercises that have been effective in reducing the severity of bloating (8-10).

In the Persian Medicine, treatment is performed in three parts: lifestyle modification, medicine, and hand interventions. Changing lifestyle is actually a six-item principle and their change and modification can help to maintain health. These principles include: Eating and drinking, sleeping and awakening, motion and rest, climate, retention and vomiting. It is very important to observe these principles as one of the basics of treatment in Persian medicine. Mohammad-ibnZakariaRazi and many scientists have considered nutritional changes as the most important treatment in patients (11).

Studies have been conducted on measures to change lifestyle and their effects on bloating and it has been suggested that taking a full history of a patient's food intake is necessary for the assessment of bloating. Reducing or eliminating certain foods, such as short-chain carbohydrates with low-absorption and high-fermentation, have been shown to effectively reduce bloating. Furthermore, the consumption of some brans has also been studied and it has been found that eating Plantago Psyllium bran is capable of reducing bloating (12-14).

**Objective**

This clinical trial study evaluated the effects of some Persian medicine eating and drinking modifications on bloating.

**METHODS:****Setting**

This single arm study was performed on patients who were referred to the gastroenterology clinic of Shahid Mostafa Khomeini Hospital from June 2017 to December 2017. Thirty-five (35) of the studied patients, satisfied the inclusion criteria and entered the study.

**Ethics**

The study was conducted after approval from the school of medicine's ethics committee (IR.Shahed.REC.1395.249 and IRCT2017050633827N1).

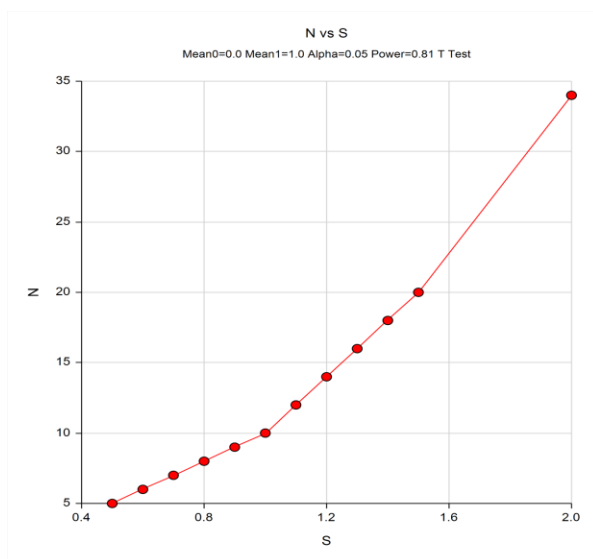
**Inclusion and Exclusion Criteria**

Based on the Rome III criteria, the inclusion criteria covered patients aged 18 to 55 years with functional bloating. Functional bloating symptoms included feeling bloated or noticeable abdominal distension for at least 3 days a month in the last 3 months lacking sufficient criteria for irritable bowel syndrome, functional dyspepsia or other functional disorders of the digestive system (15).

The exclusion criteria included abnormal abdominal examinations, acute or chronic GI diseases requiring surgery, pregnancy or lactation, debilitating diseases, high-risk signs such as weight loss >4 kg in the last three months and the presence of blood in stool, melena or hematemesis in the past three months, celiac disease, lactase deficiency, substance or alcohol abuse, lack of cooperation or interest to participate in the study.

**Sample Size**

According to the type of the study, and since the non-point difference as a minimum difference, which is clinically important, was considered, calculations were done for two standard deviation and the following graph has been drawn. Thus, with a power of 80% at a significant level of 0.05, a sample of 35 people is required.



### Methods of study

Patients who entered the study had a normal abdominal examination and normal laboratory results including: complete blood count (CBC), fasting blood sugar (FBS), blood urea nitrogen (BUN), creatinine (Cr) for kidney function, aspartate transaminase (AST), alanine aminotransferase (ALT), alkaline phosphatase (Alp) for liver function, and tissue transglutaminase (TTG) to rule out celiac disease.

Also, the patient's drug history was investigated to prevent the simultaneous use of a chemical or herbal medicine capable of affecting the function of the digestive tract, especially bloating.

Over six months, more than 100 patients were referred to the gastroenterology clinic and their eligibility to participate in the study was assessed. Of these, 51 patients entered the study as one group, while 16 discontinued the study. Finally, 35 patients (29 women, 6 men) completed the study and were evaluated.

All patients completed the reformed Gastrointestinal Symptom ROME III Questionnaire and the severity of their symptoms was evaluated according to a five-point Likert scale questionnaire (never, low,

moderate, high, very high). Thereafter, they were taught how to eat and drink.

### Dietary modifications

The eating and drinking modifications that were taught to patients in this study are as follows:

1. Not to drink water or any other beverage half an hour before, until one hour after meals.

In this case, it is prohibited for them to consume any kind of beverage, especially cold drinks. If they were very thirsty and could not stand the thirst, they were allowed to taste a little water at room temperature and wash their hands and face. They could sip a small amount of water, if the thirst persisted (less than half a cup).

2. Prolong the chewing time (chew each spoon between 25 and 30 times).
3. For each meal, just eat food and do not add extra components to the table (salads, jellies, creams, yogurt, etc. should not be eaten with food. They could, if desired, be taken as a snack).
4. At each meal, stop eating before becoming full, two to three spoons before ending (16).

### Statistical Analysis

The researchers followed patients weekly to make sure these measures were taken correctly. After 4 weeks, the severity of bloating was re-evaluated. The final score of symptoms, resulting from the evaluation, was obtained from the sum of scores of each symptom for each person. All data were collected, analyzed, and reported as mean  $\pm$  standard deviation. Statistical tests were performed by SPSS software version 16; also, T-test and Wilcoxon tests were used for data analysis.

### RESULTS:

The median ( $\pm$  SD) of patients' age was 36.8 ( $\pm$ 8) years and their mean weight was 67.8 ( $\pm$ 1) kg.

Assessing the symptoms of participants in this research indicated that most patients experienced bloating every day before the onset of the study and were recruited into the study for this reason. Table 1 presents the frequency of symptoms.

**Table 1. Frequency of bloating and belching symptoms before intervention.**

Symptoms	Frequency	Percent
Bloating	< 1 day in a month	1
	1 day in a month	1
	1 day in a week	5
	>1 day in a week	13
	Every day	15
Belching	Never	16
	1 day in a week	5
	>1 day in a week	7
	Every day	7
		20

**Table 2: Descriptive statistics of bloating and belching symptoms and Wilcoxon test for comparing bloating and belching at single arm study.**

	<i>Pre test</i>				<i>Post test</i>				<i>p.value</i>
	Mean	Std. deviation	Minimum	Maximum	Mean	Std. deviation	Minimum	Maximum	
<i>Bloating</i>	4.14	.64	3	5	1.68	.52	1	3	0.001
<i>Belching</i>	2.57	1.55	1	5	1.80	.83	1	3	0.001

Measuring the severity of symptoms in patients before and after the modification showed that bloating and belching significantly decreased in patients who adopted eating and drinking modifications. The table describes quantitative variables. The mean and standard deviation of the study participants, based on the Likert scale as described above, are presented in this table. There was a significant difference between the severity of bloating and belching before and after the modification.

### DISCUSSION:

The results of this study indicated that these two symptoms can be reduced by eating and drinking modifications for functional bloating and belching. There was also no patient in this study without change or an increase in the rate of bloating and belching. Functional bloating is a symptom with several factors including gas retention, intestinal hypersensitivity, and incomplete absorption of carbohydrates, excessive bacterial growth, physiological factors, and psychological factors (17-19).

A similar study is yet to be conducted to evaluate the effect of eating and drinking modifications on functional bloating. Studies have shown that bloating is affected by lifestyle changes such as specific diets, weight loss, and abdominal exercise. Paying attention to the quantity and quality of foods and the proper impact of this approach on reducing bloating demonstrate the importance of non-pharmacological methods in this case(20-22).

Some studies have shown that the reduced intake of short-chain carbohydrates with low-absorption and high fermentation may be effective in reducing bloating rates, but its certain and complete effect is yet to be proven. Some other studies have described its complete efficacy. Another study also showed that the use of dietary fiber foods, especially Plantago Psyllium bran is effective for the reduction of bloating (23).

This amount of effect, compared to the complete effect of these measures on bloating, shows the effectiveness of Persian medicine eating and drinking measures in the treatment of bloating.

From the point of view of Persian medicine, bloating is a multifactorial problem, but one of its main causes is stomach weakness. Eating and drinking modifications strengthen the stomach and therefore, regardless of the cause of bloating, it can be effective in reducing it, which is also supported by this study. This Persian medicine recommendation seems logical from the perspective of conventional medicine, because drinking water dilutes stomach dough, responsible for digestion.

Because digestion starts from the mouth, good chewing of each meal reduces the burden on the stomach and improves its performance. Extra components with food require a specific period of time for digestion in the stomach. Eating these substances together reduce the stomach's ability to digest them and could result to bloating. The amount of food eaten, if more than the stomach's capacity, reduces the digestive capacity of the stomach.

These trainings included four Persian medicine eating and drinking modifications, which were taught to patients and they observed reduced bloating. All in all, this is the first study to investigate the effect of these modifications and support the effectiveness of Persian medicine eating and drinking modifications on bloating. As a result of the lack of a complete and effective treatment protocol for bloating, these modifications can be taken into consideration. It should also not be forgotten that the use of medications, of any kind, is often associated with adverse effects and complications and imposes great costs on the patient and health system. In such a case, using a method that reduces patients' bloating without requiring medication can be very cost-effective and useful.

The limitations of this study include the following. Functional bloating is a diagnosis proven by the absence of other digestive symptoms in patients. For this reason, few patients are referred to the gastroenterology clinic with functional bloating. Also, this study was based on training the participants, and the proper training of participants and follow-up was one of the difficult aspects of conducting this study. During the study, many patients were excluded due to lack of proper training. In addition, better results can be obtained, if this study is conducted on more patients with a longer follow-up period.

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