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RESEARCH ARTICLE

An Open-label Prospective Study to Assess the Effectiveness, Tolerability, and Safety of *Ayurvedic* Intervention (*Kutajarishta*) in the Treatment of Irritable Bowel Syndrome

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Abstract

Background: Irritable Bowel Syndrome (IBS) is a major health problem that impacts around 15% of the world's population. IBS has a detrimental impact on one's quality of life and might lead to missed school or a job. Modern medicine for the treatment of IBS symptoms is still limited in clinical practices due to side effects, high relapse rates, and the appearance of being ineffective in enhancing IBS patients' quality of life. As a result, there is a clear need to explore more potent and comprehensive treatments for this disease. Several herbal medicines in the Ayurvedic school of medicine can fill this vacuum. **Aim:** To explore the therapeutic effectiveness, tolerability and safety of *Kutajarishta* in the treatment of IBS. **Methods:** The current trial included 180 confirmed cases of irritable bowel syndrome of subtype mixed (IBS-M) who met the diagnostic criteria as specified by the Rome III criteria, regardless of their gender, religion, or socioeconomic background. *Kutajarishta* was administered 25 ml twice a day orally with an equal amount of water. Routine haematological and biochemistry tests, subjective parameters, IBS severity score, and WHO-QOL BREF score were periodically examined to determine the efficacy and safety of *Kutajarishta* during the 98-day study (including a two-week follow-up without medication). **Results:** The trial drug *Kutjarishta* confirmed statistically significant enhancement in the clinical manifestations along with elevation in the WHO QOL BREF score and a reduction in the IBS severity score. There was no impairment in renal function tests and liver function, suggesting that trial therapy has an excellent safety profile. **Conclusion:** *Kutajarishta* is found to be safe, tolerable, and an effective remedy in the treatment of IBS.

Major Findings: In this clinical evaluation of 25ml of *Kutjarishta* twice daily was found effective in relieving the cardinal features of IBS, along with a reduction in IBS severity score and elevation in the WHO-QOL BREF Score.

Keywords: Gastrointestinal Disorders, Irritable Bowel Syndrome (IBS), *Kutajarishta*, Therapeutic Efficacy

1. Introduction

Irritable Bowel Syndrome is one of the major health problems that leads to medical attention. It has a large economic impact and is linked to a high rate of morbidity in Western nations[1]. IBS may be classified into four subcategories based on bowel behaviours: constipation-predominant (IBS-C),

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diarrhoea-predominant (IBS-D), unspecified (IBS-U), and mixed (IBS-M), with IBS-D being the most common· IBS-C is estimated to account for 10-15% of all IBS cases. IBS-M is estimated to account for 25-30 % of IBS cases, and IBS-D is the most common subtype, accounting for 30-40% of IBS cases. People with IBS are more likely to suffer from chronic fatigue syndrome, severe depression, and anxiety. It's a functional Gastrointestinal (GI) condition that includes symptoms in the mid or lower GI tract that aren't induced by morphological or biochemical abnormalities[2-4]. These symptoms and signs are linked to a condition known as gastrointestinal motility dysfunction. In the absence of any identifiable organic disease, the typical clinical characteristics include stomach discomfort, altered bowel habits, and mental symptoms such as anxiety or sadness[5]. It's a chronic condition that defies therapy, and its symptoms are frequently intermingled with a variety of personality traits. IBS seems to be comparable to the *Grahani Roga*[6] in the *Ayurvedic* system of medicine. The use of antidiarrheals, prokinetics, anticholinergics, serotonin receptor antagonists, guanylate cyclase C (GC-C), TCAs (tricyclic antidepressants), chloride channel activators, and bulk-forming laxatives are still limited in clinical practice due to side effects, high cost of medication, high relapse rates, and a lack of success to improve the quality of life of IBS patients[7-11]. Therefore, it is necessary to search for better treatment for this disease. *Ayurveda* has several anti-diarrhoeal, anti-inflammatory, and anti-bacterial formulations in its herbarium that can fill this gap. So, the current study was undertaken to appraise the therapeutic efficacy and safety of *Kutajarishta* in the management of IBS. In *Ayurvedic* literature, *Kutajarishta* is used to treat diarrhoea, ulcerative colitis, bleeding dysentery or dysentery, irritable bowel syndrome, dysentery fever, Crohn's disease, sprue or malabsorption syndrome, and other gastrointestinal disorders[12-17]. Therefore, this trial was planned to assess the evidence-based data on the effectiveness, tolerability and safety of *Kutajarishta* in the management of irritable bowel syndrome on scientific parameters. The aim of the study was to determine the clinical effectiveness, tolerability and safety of *Kutajarishta* in the management of IBS.

2. Materials and Methods

2.1 Study Design

This clinical study is an immense multicenter open-label study which was conducted in three regional institutes of the Central Council for Research in Ayurvedic Sciences, New Delhi, India. The trial protocol was endorsed by the Institutional Ethical Committees (IEC) of the respective institutes. An open-label study is a type of clinical trial where both the researchers and participants are aware of the treatment being administered. Open-label studies are often used when blinding is not feasible or ethical, such as in cases where the treatment's effects are visibly apparent or when comparing two similar treatments. The research was accomplished in compliance with the principles of the World Health Organization-Good Clinical Practice (WHO-GCP). All subjects given written informed consent after being fully informed about the trial medicine, the research's goal, and the course of action required during the trial. The clinical trial was registered with the Clinical Trial Registry of India (CTRI) vide CTRI number (CTRI/2014/09/005066).

2.2 Study Participants

180 people with confirmed IBS-M (irritable bowel syndrome) who fulfilled the diagnostic standards as suggested by the Rome III criteria. These people were selected from the outpatient department of Central Ayurveda Research Institute, Patiala (Punjab), Regional Ayurveda Research Institute, Mandi (HP) and Jammu, regardless of their religion, gender, and socio-economic status. Patients were screened based on exclusion and inclusion criteria and enrolled in the study after proceeding with signed informed permission.

2.3 Inclusion Criteria

Subjects of either sex aged between 18 and 65 years who have abdominal pain or discomfort lasting three months or more, with symptoms occurring at least three days a month and being connected to two or more of the following: defecation provides relief from discomfort or pain. The onset of pain or discomfort is caused by a change in stool shape/appearance (loose or hard stools). A change in bowel frequency causes the onset of pain or discomfort.

2.4 Exclusion Criteria

Subjects suffering from Gastroesophageal Reflux Disease (GERD)/hyperacidity, rectal bleeding, and mixed infection with parasites, patients with T-1 DM and T-2 DM, patients with diagnosed any malignancy, subjects on antidepressants, corticosteroids, anticholinergics, etc., the patient has a history of unstable heart disease, symptomatic subjects with evidence of heart failure, participants with concomitant liver disease or pulmonary dysfunction, kidney disease, drinking alcohol and/or using drugs, patients with a history of gastrointestinal disease or celiac disease and patients with a family history of intestinal malignancy.

2.5 Outcome Measures

The changes from baseline to day 84 in the IBS Severity score were the primary outcome measure. The secondary measures were the change in the WHO-QOL BREF score and the change in the symptomatology of IBS.

2.6 Study Intervention

Kutajarishta is a liquid Ayurvedic formulation containing *Madhuka pushpa* (*Madhuca longifolia*, flower), *Kutaja* (*Holarrhenan antidysenterica*, stem bark or root), *Ghambari/Kashmari* (stem bark, *Gmelina arborea*), *Mrdvika* (*Vitis vinifera*, dry fruit), *Dhataki* (*Woodfordia fruticosa* (L.) Kurz), water and *Guda* (jaggery). It is used to treat intestinal diseases such as diarrhoea, bloody dysentery, ulcerative colitis, irritable bowel syndrome, dysentery fever, Crohn's disease, sprue or malabsorption syndrome, *etc*. It has a self-made alcohol content of 5 to 10%. This self-produced alcohol, along with the water in the product, acts as a vehicle for delivering water and alcohol-soluble active substances to the body. *Kutajarishta* was given to selected patients in a dose of 25 ml twice a day with an equal amount of water after meals for 84 days. Patients were instructed on *pathya* (good) and *apathya* (bad) management. The evaluation was done 2 weeks after the treatment. The well-known Ayurvedic formulation *Kutajarishta* (Batch No. AAA 11, Date of manufacturing- Feb, 2014) was acquired from Indian Medicines Pharmaceutical Corporation Ltd. (A Government of India Enterprise), Mohan Distt. Almora Uttarakhand. Following the completion of the 12-week treatment period, the patients were tracked without medication for 2 weeks.

2.7 Study Procedure

Patient's demographic information, family history, medical history, especially regarding Irritable Bowel Syndrome (IBS), *Sharirik Prakriti,* and other important information were recorded at the beginning of the trial (Baseline visit). The planned visits are for two weeks, starting on visit 2 (day 14), visit 3(day 28), visit 4 (day 42), visit 5 (day 56), visit 6 (day 70), and visit 7 (day 84). At each follow-up visit, patients were evaluated and given study medication until the 84th day. A follow-up without medication was also completed two weeks after the scheduled 84th day, on the 98th day. All patient data were captured in the preliminary reference files (CRFs) at the research site, as well as in electronic files (e-formats) prepared in MS-Excel with multiple data analyses to guarantee data entry. All participating trial sites have submitted Photocopies of CRFs and electronic-CRFs of all registered subjects to CCRAS, New Delhi, for verification. Figure 1 provides information on the clinical evaluation and study period.

2.8 Statistical Analysis

The study used a paired t-test to evaluate the change in response from baseline to day 84 for the primary and secondary outcomes, which are the WHO-QOL BREF score and the IBS severity score, respectively. pvalues with values less than 0.05 were regarded as meaningful. All statistical analyses were performed using the Statistical Software for Scientific Research (SPSS) version 15.0.

3. Results

3.1 Patients' Demographic Profile

In this study, 180 patients were enrolled, with 10 dropping out during the study. A clinical focus was performed, and data for all patients who had at least a 14-day visit were analysed using the Last Observation Before (LOCF) approach. Thus, data from 178 patients were used in the statistical analysis. The data of the 178 subjects showed that the largest proportion of subjects were from the age group of 39–48 years old, with 60.7% of patients being men, 85.4% being married, 92.7% subjects were literate and above the poverty line, 49.4% working at a desk, and 81.5% having loose stool consistency. The physical characteristics of the subjects are given in Table 1.

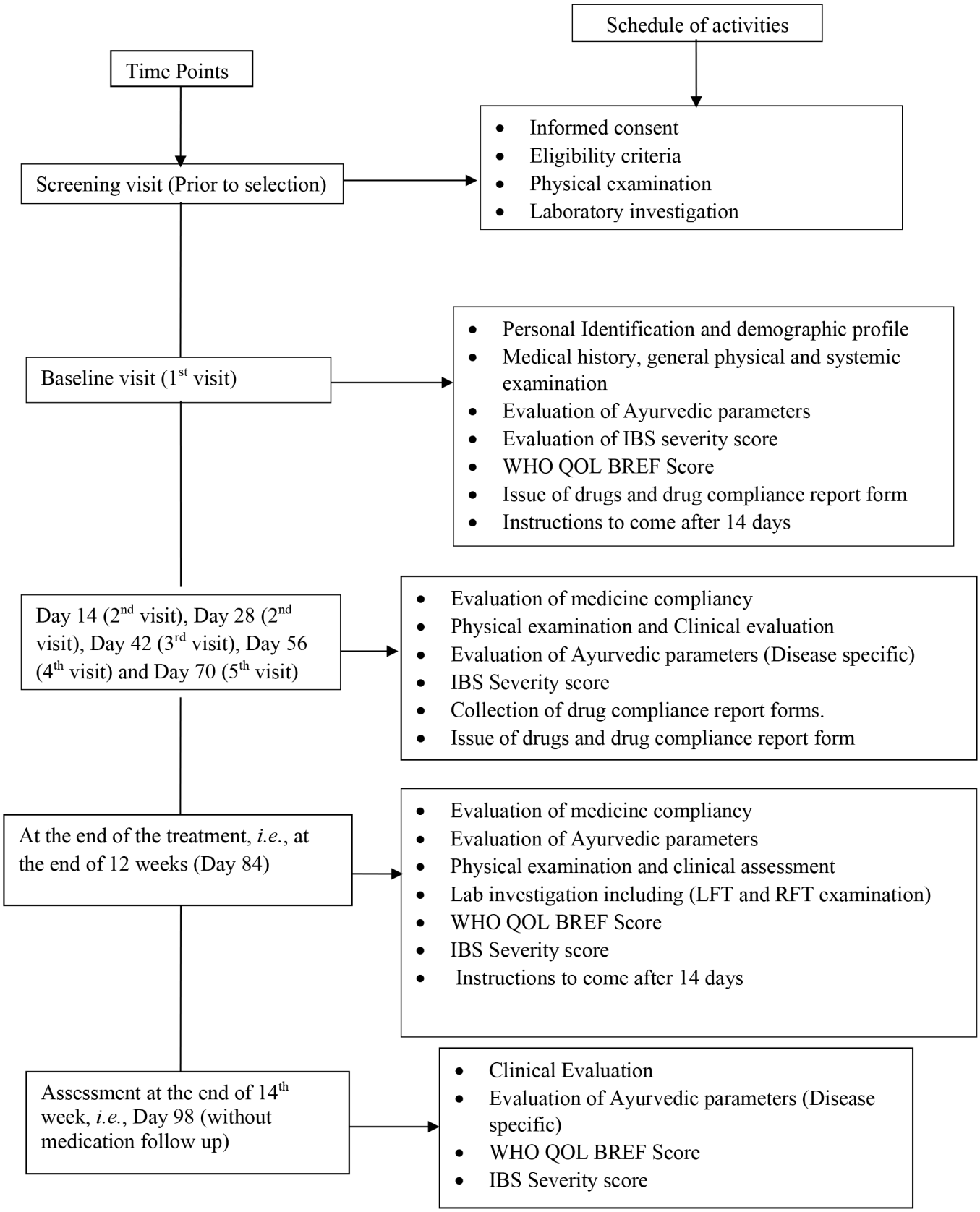


Figure 1. Study schedule.

The evaluation of clinical results was performed in several variables in terms of clinical features (complaints and related symptoms) and biochemical parameters, IBS severity score and WHO QOL BREF score. All patients underwent various tests, such as routine blood count, FBG, PPBG, liver function tests, and kidney function tests at baseline and after 84 days of treatment to know the effectiveness and safety of the trial drug *Kutajarishta*.

Table 1. Distribution of subjects according to their physical parameters

Physical parameters (n = 178)	
Height in metres	1.64 (0.08)
Weight in kilograms	62.68 (11.15)
Respiratory rate (pm)	15.99 (1.58)
Pulse rate (pm)	77.48 (3.42)
Blood pressure (mm Hg)	
Systolic BP	120.75 (7.95)
Diastolic BP	79.61 (6.51)

Values are indicated as mean (standard deviation)

3.1.1 *Effects of Kutajarishta on Outcome Measures*

The effect of *Kutajarishta* on IBS Severity Scale Score and WHO Quality of life score BREF Score. It was found that the mean IBS severity score at baseline was 236.32 (82.27) and decreased to 50.13 (57.45) after the trial period of 84 days, which was statistically highly significant ($p<0.001$). Additionally, it has been demonstrated that *Kutajarishta* improves patients' quality of life as measured by the WHO Quality of Life BREF Score. A meaningful improvement was observed ($p<0.001$) in all four domains of the WHO quality of life BREF Score, namely physical, mental, social, and environmental. Table 2 and Figures 2 and 3 show the outcome of the study.

Table 2. Effect of the *Kutajarishta* on outcomes of the study

Outcomes (n = 178)	Before treatment, Day 0 mean (+SD)	After treatment, Day 84 mean (+SD)	t-value$	pvalue
IBS severity scale score	236.32 (82.27)	50.13 (57.45)	24.28	<0.001
WHO Quality of life score BREF Score				
Physical health	57.13 (14.04)	71.92 (11.73)	12.10	<0.001
Psychological	59.22 (16.35)	70.01 (10.00)	10.25	<0.001
Social relationships	69.87 (13.31)	74.08 (8.84)	5.07	<0.001
Environment	60.92 (14.07)	64.70 (11.47)	5.73	<0.001

Values are expressed as mean (+SD); $-compared using paired t-test; *p value<0.05 considered as meaningful

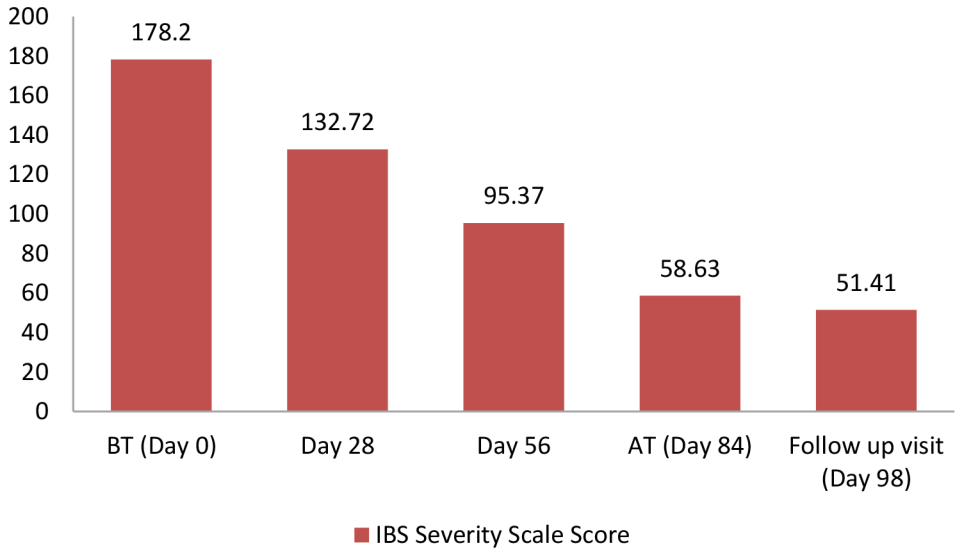


Figure 2. Effect of *Kutajarishta* on IBS severity scale score.

3.1.2 Effects of Kutajarishta on Clinical Features of IBS

The treatment with the experimental drug *Kutajarishta*, improvements were seen in clinical areas such as abdominal pain, chronic or recurrent abdominal pain, IBS-C (constipation), IBS-D (Diarrhea), speed of bowel movement, the feeling of incomplete evacuation, secretion of mucus, *Pravahana* (tenesmus), *Udara shula* (abdominal pain), *Anaha* (distension of abdomen), *Mala Tyaga Santushti* (satisfaction after a defection), *Kapha Nihssarana* (mucus in stool), *Udara Atopa* (tympanitis), *Mala Durgandha* (foul odour of stool), *Bhojanopranta mala tyaga* (defecation after taking meals) and *Guda Shula* (pain in the perianal region) After 84 days of management with *Kutajarishta* a statistically meaningful improvement was noted these features (Tables 3 and 4).

3.1.3 Effects of the Treatment on Safety Parameters

Safety parameters, *viz.*, serum creatinine, serum urea, ALT (SGPT), and AST (SGOT), were evaluated at the beginning and upon completion of the treatment period. From the beginning to the end of treatment, some modifications were observed, but they were within the normal range.

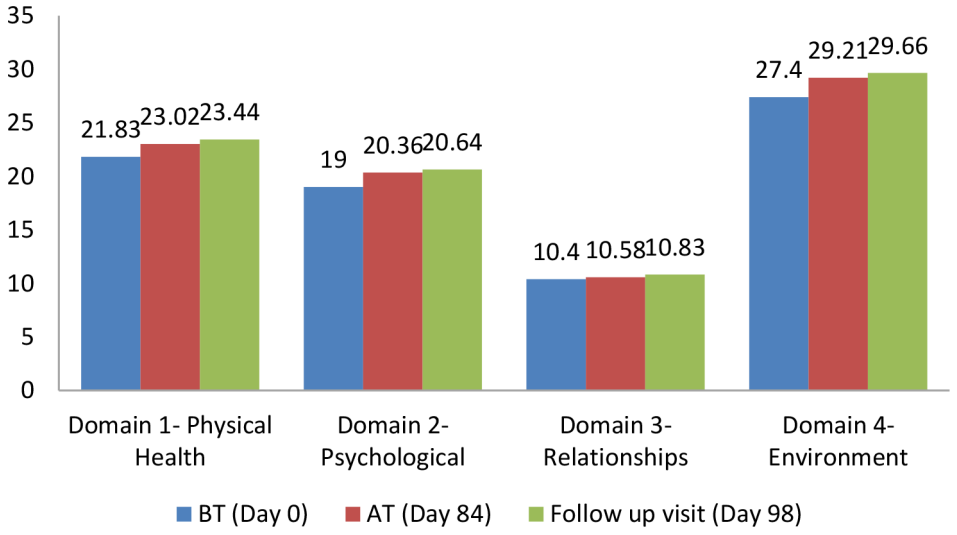


Figure 3. Effect of *Kutajarishta* on WHO QOL BREF SCORE.

Table 3. Effect of *Kutajarishta* on clinical features (N = 178)

Clinical features	Before treatment Day 0 n(%)	After treatment Day 84 n(%)	#p value	% of relief	Follow-up visit Day 98 n(%)	$p value	% of relief
Chronic or recurrent abdominal discomfort or pain	177 (99.4)	44 (24.7)	<0.001	74.7	38 (21.3)	<0.001	78.1
Abdominal bloating	166 (93.3)	87 (48.9)	<0.001	44.4	75 (42.1)	<0.001	51.2
Constipation (IBS-C)	77 (43.3)	15 (8.4)	<0.001	62	13 (7.3)	<0.001	36
Diarrhoea (IBS-D)	155 (87.1)	30 (16.9)	<0.001	70.2	31 (17.4)	<0.001	69.7
Urgency of bowel movements	154 (86.5)	29 (16.3)	<0.001	70.2	26 (14.6)	<0.001	71.9
Feeling of incomplete evacuation	107 (60.1)	30 (16.9)	<0.001	43.2	27 (15.2)	<0.001	44.9
Passage of mucus	10(5.6)	2 (1.1)	<0.05	4.5	2 (1.1)	0.021	4.5

Values are expressed as n (%)
#Compared using mc-nemar test at Day 0 and Day 84
$Compared using mc-nemar test at Day 0 and Day 98
*p value<0.05 considered as meaningful

Table 4. Effects of *Kutajarishta* on disease-specific ayurvedic symptoms (N = 178)

Symptoms	Before treatment Day 0 n(%)	After treatment Day 84 n(%)	#p-value	% of relief	Follow-up visit Day 98 n(%)	$p -value	% of relief
Pravahana (Tenesmus)	127 (71.3)	21 (11.8)	<0.001	59.5	19 (10.7)	<0.001	60.3
Udara Shula (Pain in Abdomen)	169 (94.9)	41 (23.0)	<0.001	71.9	36 (20.2)	<0.001	74.7
Anaha (distension of abdomen)	156 (87.6)	82 (46.1)	<0.001	41.5	71 (39.9)		47.7
Mala Tyaga Santushti (Satisfaction after defecation)	45 (25.3)	140 (78.7)	<0.001	53.4	145 (81.5)		56.2
Kapha Nihssarana (Mucus in stool)	11 (6.2)	4 (2.2)	0.065	4.0	4 (2.2)	0.065	04.0
Mala Durgandha (Foul odour of stool)	98 (55.1)	24 (13.5)	<0.001	41.6	23 (12.9)	<0.001	42.2
Udara Atopa (Tympanitis)	88 (49.4)	19 (10.7)	<0.001	38.7	15 (8.4)	<0.001	41.0
Bhojanopranta mala tyaga (Defecation after taking meals) 159 (89.3) 38 (21.3) <0.001 68 38 (21.3) <0.001 68.0							
Gud Shula (Pain in the perianal region)	6 (3.4)	2 (1.1)	0.219	2.3	2 (1.1)	0.219	02.3

Values are indicated as n (%)
[#]Compared using mc-nemar test at Day 0 and Day 84
[$]Compared using mc-nemar test at baseline and 98[th] day
*pvalue<0.05 considered as meaningful

4. Discussions

Irritable Bowel Syndrome (IBS) has a significant financial effect on both patients and society[18]. In the absence of anatomical abnormalities, it is characterised by persistent or recurrent abdominal symptoms (abdominal discomfort and/or pain) and an abnormality of bowel movements (diarrhoea and/or constipation). The natural history of IBS is characterised by relapsing and remitting symptoms[19-21], and the chronic nature of the condition means that it is a significant financial burden due to the costs of consultations[22,23], investigations[24], prescribed and over-the-counter pharmacological therapies[25], and absence from work[26]. This condition is quite common, and it's linked to a lot of mental discomfort, poor Health-Related Quality of Life (HRQL), disability, and expensive healthcare expenditures. Psychosocial variables have a significant influence on the modulation of disease symptoms and clinical outcomes[27]. IBS may be classified into four subcategories based on bowel behaviours: constipation-predominant (IBS-C), diarrhoea-predominant (IBS-D), unspecified (IBS-U), and mixed (IBS-M)[28], with IBS-D being the most common[29]. There is no definite investigation as no biomarker has been found, so IBS is diagnosed clinically. IBS appears to be similar to *Grahani Roga*, which has been well-documented in Ayurvedic literature. *Grahani Roga is* an *Agnimandyajanya Vikara* in which the vitiation of *Agni* (*Mandagni*) is the main factor. This eventually leads to *Ama* formation and can lead to diarrhoea or constipation. The major Dosha involved in its pathophysiology is *Vata Dosha,* together with the cooperation of *Kapha Dosha* and *Pitta Dosha*. IBS is mainly a functional motility disorder. The movements and the absorption are mainly undertaken by the *Vatadosha*. The *Srotas* involved are *Annavaha, Purishava, Rasavaha,* and *Manovaha Srotodushti.* In *Grahani Roga Dusti,* it mainly lies at the level of *Apana Vayu* and *Samana Vayu*. The *Chala, Laghu gunas* of *Vata*, *Drava gunas,* and *Sara guna* of *Pitta* are

involved in the *Atisara* stage of IBS. In the case of the *Vibandha* stage of IBS, *Ruksha* and *Sita Gunas* of *Vata* are mainly involved. The *Srotodusti* involved in it are the *Atipravritti* and *Sanga* types. *Dushti* mainly occurs in *Annarasa*. The *Mansika Bhava,* which hampers *Agni* and *Rasavahasrotas* and *Ahara Vihara,* which cause *Vatakopa,* are the main causative factors of IBS. *Langhana*, *Pachana* and *Deepana drugs* are given in the initial stage of IBS. The role of *Pitta dosha* in IBS is also important because the main centre of *Pitta* is *Pachyamanasaya,* where *Grahani* and *Pittadharakala* are located. According to *Acharya Charaka*, the action of medicine depends on its *Guna*, *Rasa*, *Virya*, *Prabhava*, or *Vipaka*[30]. To suppress the *Samprapti* of the disease, the best medicine should contain *Pachana* and *Deepana* products in general. *Kutaja* bark is the main ingredient in making *Kutajarishta*. *Kutaja* bark is astringent, digestive, and bitter; useful in heart disease, dysentery, diarrhoea, fever, dyspepsia, gout, skin diseases, and bacterial infections. *Kutaja*, because of its *Laghu* (lightness), *Rooksha* (dryness) properties and *Kashaya* (astringent) *Rasa*, *Katu Vipaka*, followed by *Agni Deepaka* and also *Amapachaka*. *Sheetavirya* and *Kashaya Rasa* have *Stambhana* and *Upashoshana* properties that help reduce colonic motility. The *Sangrahi* device of *Kutaja* is effective in correcting the frequency of bowel movements and the consistency of the stool. In *Kutajarishta,* in addition to *Kutaja*, *Prakshepa Dravyas* like *Dhataki* (*Woodfordia fruticosa*) and *Kashmari* (*Gmelina arborea)* have properties like *Deepana* and *Pachana,* which accentuate the action of the main ingredient. *Draksha (Vitis vinifera)* and *Madhukapushpa (Madhuca longifolia)* have *Vatapittasamana* properties, which help in balancing the vitiated *Dosha*s. In total, *Kutajarishta* is attributed with *Grahi, Deepana, Tridoshahara, Vatanulomana Pachana, Amanashaka,* and *Vibandhahara,* properties which check and pacify the symptoms and *Samprapti* (pathogenesis) of IBS.The goal of IBS treatment is to provide universal relief of the various symptoms of IBS and to reduce the symptoms of IBS. *Kutaja,* the main component of the formulation *Kutajarishta*has potent immune-stimulatory effect[31], anti-diarrhoeal activity[32], antimotility and antisecretory[33], anti-inflammatory and analgesic[34,35], anthelminthic and anti-microbials activity[36], anti-mutagenic[37], antioxidant/ free radical scavenging[38,39], anti-malarial activity[40] and anti-amoebiasis and anti-giardiasis properties[41], which is good for all medicines to prevent IBS-induced inflammation. *Kutajarishta*is an *Asavarista* formulation in which microbial transformation leads to the production of alcohol, which aids in the extraction of medicinal properties while also increasing the bioavailability of the components. Multiple phytochemicals with therapeutic potential are converted into liquid form in these dosage formulations, resulting in a safe, powerful, and easily given liquid form. The trial drug *Kutajarishta* has proved to be effective as this formulation has achieved statistically significant enhancement in clinical manifestations such as chronic or recurrent abdominal discomfort or pain, abdominal bloating, constipation (IBS-C), diarrhoea (IBS-D), the urgency of bowel movements, feeling of incomplete the evacuation, passage of mucus, *Pravahana* (tenesmus), *Mala Tyaga Santushti* (satisfaction after a defection), *Anaha* (distension of abdomen), *Guda Shula* (pain in the perianal region), *Mala Durgandha* (foul odour of stool), *Udara shula* (abdominal pain), *Kapha Nihssarana* (mucus in stool), *Bhojanopranta mala tyaga* (defecation after taking meals), *Udara Atopa* (tympanitis of abdomen) and the IBS severity score decreased to the number of patients enrolled in the present trial. On a detailed analysis of the data, it was found that 81.5% of the patients in the clinical trial presented with loose stool consistency. The *Sangrahi* and *Sthambhana* properties of *Kutajarishta* may have helped in normalising the stool pattern. There was also an improvement in the WHO-QOL BREF score. The quality-of-life profile is the WHO-QOL BREF score. Four registered scores can be calculated. Separately, two items are examined: question 1 asks about a person's overall sense of quality of life, and question 2 asks about a person's overall perception of health. The four-point scale shows how a person perceives their quality of life in each of the four dimensions. The domain scores are graded from high to low in a positive manner (*i.e.*, better life quality is indicated by higher ratings). The higher the score, the lower the degree of disability. In other words, a score of 100 equals no disability, and a score of zero equals maximum handicap. Following the completion of the trial, there was an increase in the score of all four domains, *viz,* social relationships, psychological, physical health, and environmental components of quality of life, indicating that the quality

of life had improved. This shows the effectiveness of the *Kutajarishta*in the management of IBS. There was no significant impairment in liver functions, kidney functions, and routine blood parameters, indicating *Kutajarishta's* safety profile. There were no clinically significant adverse events, either observed or reported, throughout the entire research period. The changes seen after the treatment are satisfactory**.** Thus, the therapeutic efficacy and safety of *Kutajarishta* in IBS have been proven.

4.1 Limitations of the Study

The limitation of the present study is that it was a single-arm open-label study. Future studies with an allergy panel should also be included. Cases of IBS in children and the geriatric population were not included in the study. Further double-blind RCT with larger sample sizes are needed to confirm these findings.

5. Conclusion

*Kutajarishta*in, a dosage of 25 ml twice daily with an equal water quantity, produced a meaningful response in relieving the clinical features of irritable bowel syndrome, along with a reduction in IBS severity score and elevation in the WHO-QOL BREF score. Also, there was no elevation in markers of hepatotoxicity and renal toxicity in patients consuming *Kutajarishta,* which shows the trial drug's safety. The trial drug *Kutajarishta* drug has been confirmed to be tolerable, safe, and effective in subjects with IBS. Thus, it could be determined that *Kutajarishta* medicine is safe and effective in the treatment of irritable bowel syndrome. Further double-blind RCT with larger sample sizes are needed to confirm these findings.

6. Acknowledgement

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