

## ⇒ Research Article



# The Effectiveness of Schema Therapy Intervention on Somatic Symptom Experience, Medication Adherence, and Perceived Stress in Patients With Irritable Bowel Syndrome

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**Background:** Irritable bowel syndrome (IBS) is one of the most prevalent gastrointestinal diseases that affects a significant part of the community. This study aimed to evaluate the effectiveness of schema therapy on the somatic symptom experience, medication adherence, and perceived stress in patients with IBS.

**Methods:** The research method was a quasi-experimental research with pre-test, post-test, and follow-up and a control group. The statistical population of this study consisted of all patients with IBS who referred to medical centers and neurologists between November and January 2017. The study sample included 30 patients with IBS who were randomly divided into equal schema therapy and control groups. The intervention lasted two months. Perceived Stress Scale (PSS-14), Somatic Symptom Experience Questionnaire (BSS-FS), and Medication Adherence Questionnaire (MMAS-8) were used to collect data. In this study, means and standard deviations and analysis of variance with repeated measures were employed for descriptive statistics and the inferential analysis of results, respectively, using SPSS, version 22.

**Results:** The results showed that schema therapy was effective on somatic symptom experience ( $P < 0.001$ ), medication adherence ( $P < 0.001$ ), and perceived stress ( $P < 0.001$ ) in patients with IBS.

**Conclusion:** It can be concluded that schema therapy was effective on somatic symptom experience, medication adherence, and perceived stress in patients with IBS; thus, it can be used to reduce psychological problems in patients with IBS.

**Keywords:** Irritable bowel syndrome, Medically unexplained symptoms, Medication adherence, Psychotherapy

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**Background**

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal diseases that affects a significant part of the community. The etiology of IBS is yet unknown, and various parameters are involved in its formation, including decreased endocrine cells of the gastrointestinal tract, increased visceral sensitivity, local inflammation, abnormal intestinal flora, and psychological factors (1). Although there are no specific organic causes of this disease, abdominal pain, diarrhea, constipation, or bloating affect their quality of life (2) so that absence from work and reduced quality of social relationships are important complications of this disease. Medication adherence recommendations have long been an issue in the patient-clinician relationship, and non-adherence has always been an important and multifaceted problem in the field of health. Adherence has been seriously considered, and during this period, a

major part of disease exacerbation in these patients, along with the health literature has been devoted to this issue (3).

IBS pain is a serious problem that negatively affects the quality of life of people with this disease and their families and causes severe stress and discomfort from pain and illness and occasionally aggressive behaviors; such uncontrolled behaviors are a response to fears and perceived stress caused by disease and pain in patients with IBS (4). Perceived stress is a state that reflects an overall assessment of the importance and severity of environmental and personal challenges. Therefore, both individual and environmental factors are important in the perception of stressors. Influential situational factors provide the context for the situation, and the individual shows individual factors in relation to the situation. How these environmental and individual factors are perceived provides an assessment of whether the situation is

stressful or non-stressful (5).

According to this model, incompatible schemas in interaction with negative life events and the creation of cognitive vulnerability make patients with IBS prone to dysfunctional attitudes, helplessness, and mental disorders. This model also represents that on the one hand, IBS and its stressful stimuli are interpreted as negative life events, and on the other hand, patients have schemas about themselves as patients with IBS, which have a great impact on their final adaptation to their disease (6). Since these schemas act against the management objective and lead the individual to a disability, it is essential to help the patient with IBS to recognize and replace them with a more realistic and efficient belief system that there is a self-body network composed of specific neural impulse patterns in humans. This network interacts with the peripheral nervous system and cognitive structures of the brain (e.g., its own schemas and pain schemas), and personality-based assessment processes with stress sources, disrupting the return to vital balance, exacerbating stress, and resulting in different individual responses to the stresses associated with IBS (7).

### Objectives

This study aimed to investigate the effectiveness of schema therapy on somatic syndrome experience, medication adherence, and perceived stress in patients with IBS.

### Materials and Methods

A quasi-experimental research method with pre-test, post-test, and follow-up and a control group were considered in this study. The statistical population of this study included all patients with IBS referring to medical centers and neurologists between November and January 2017. The study sample consisted of 30 patients with IBS who were randomly divided into two equal groups (schema therapy and control groups). It should be noted that the number of research samples was selected to be 30 people, including 15 people in each group based on an effect size of 0.25, alpha of 0.05, and power of 0.80. Considering the number of lost samples according to previous studies, the probability of sample loss in this study was 5 people in each group. The intervention period was 2 months. The inclusion criteria were diagnosis of IBS based on Rome II criteria, diagnosed by a gastroenterologist, and a lack of receiving psychological treatment during the past three months. On the other hand, the exclusion criteria included having symptoms such as gastrointestinal bleeding, blood in the stool, fever, 10% weight loss in the last 6 months, having a family history of colon cancer, having severe psychiatric illnesses, and being first-degree relatives or the neighborhood of the patients. The patients in the control group received the usual treatment of IBS by a gastroenterologist, but the intervention group, in addition to the usual treatment, were subjected to schematic therapy

training programs designed in an executive protocol. The experimental group received schematic therapy, while the control group received no intervention.

To observe ethical consideration, the purpose of the study was explained to all subjects and they were ensured of data confidentiality (only coding was used). The collective analysis of the information was discussed. At the end of the phone numbers, it was explained that people who want to achieve the questionnaires' results can be informed of the results by calling.

### Perceived Stress Scale

This scale was developed by Cohen et al (1983). The original version of the Perceived Stress Scale (PSS-14) consists of 14 items measuring an individual's feelings and thoughts about events and situations occurred over the past month. This scale contains 14 items (7 positive and 7 negative items). Each item is rated on a 5-point scale from never (0) to very often (4). In other words, all 7 positive items have inverted scores. Cronbach's alpha was obtained as an indicator of the internal consistency of PSS ( $\alpha = 0.81$ ) in the mentioned study. Cronbach's alpha method was used again in a study by Maroufizadeh et al (8) on a different group of subjects. Cronbach's alpha was equal to 0.84 for the whole scale, indicating the acceptable reliability coefficients of the scale (8).

### Somatic Syndrome Experience Questionnaire (BSS-FS)

The questionnaire was designed according to the Intestinal Symptoms Severity Scale developed by Boyce et al in Australia. The questionnaire had 24 questions, eight of which evaluated eight gastrointestinal symptoms, including loose and watery faces, hard and fragmented faces, abdominal pain, frequency of bowel discharges, bloating, feeling of need for rapid defecation, constipation, and abdominal discomfort, which are the main and most common symptoms of irritable bowel disease. The other 16 questions in the questionnaire assessed psychological stress and its impact on daily life. A retest was performed between two weeks to obtain reliability. The correlation of the scores obtained for the frequency and severity of symptoms were equal to  $r = 0.76$  and  $r = 0.73$ , respectively, and the internal reliability was  $r = 0.81$  (9).

### Medication Adherence Questionnaire (MMAS-8)

The medication adherence scale is a self-reported questionnaire designed in 2010 by a group of researchers and contains eight items. High, moderate, and low medication adherence with a score of 8 out of 8, 6 out of 8, and  $<6$  are determined on this scale, respectively. The medication adherence scale was constructed from a previously valid 4-items scale and supplemented with other items, including conditions with medication adherence. The reliability of the medication adherence scale was achieved by Cronbach's alpha to be 0.89, which

indicates the optimal reliability of this scale (10).

The schema therapy training protocol was performed in 10 sessions (one session per week) for 90 minutes based on Young et al (11). Table 1 summarizes the schema therapy sessions.

In this study, mean and standard deviation (SD) were used for descriptive statistics, and analysis of variance (ANOVA) with repeated measures was also employed for the inferential analysis of the results. The above analyzes were performed using SPSS software, version 22.

## Results

The participants in this research were in the age range of twenty-six to fifty-three years, and 46.70% and 53.30% were men and women. The mean ( $\pm$  SD) age of the experimental and control groups was 39.50 ( $\pm$  8.11) and 38.50 ( $\pm$  8.55), respectively ( $P > 0.05$ ). Table 2 provides the mean and SD of a somatic symptom experience, medication adherence, and perceived stress in the experimental and control groups.

To measure the equality of variances, data were evaluated with Levene's test of homogeneity of variance. The results showed that variances of the experimental and control groups for somatic symptom experience ( $F = 1.18$ ,  $P = 0.304$ ), medication adherence ( $F = 1.24$ ,  $P = 0.28$ ) and perceived stress ( $F = 1.10$ ,  $P = 0.259$ ) were equal. Based on the results, significant homogeneity was found

using multivariate analysis of covariance (MANCOVA) tests, including Pillai's trace, Wilks' lambda, Lawley-Hotelling trace, and Roy's largest root. Experimental and control groups differed in terms of at least two dependent variables; therefore, these variables could be used to analyze the data. The repeated measures ANOVA results on somatic symptom experience, medication adherence, and perceived stress are provided in Table 3. This analysis represented that the two groups were different in three investigated variables (Table 2).

The results of Table 3 indicate that ANOVA is significant for within- (time) and between-subject factors, as well as group and time interaction for all three variables. Furthermore, the Bonferroni post hoc test was applied to compare pairs in groups.

The results of Table 4 revealed that the variable scores of somatic symptom experience and perceived stress in the schema therapy group and in the post-test stage were lower compared to the pre-test stage ( $P < 0.001$ ). There was a significant difference between the follow-up and pre-test stages with regard to the somatic symptom experience and perceived stress ( $P < 0.001$ ), but no significant difference was observed between the two post-test and follow-up stages in this respect. Based on the results, the variable scores of medication adherence in the schema therapy group and in the post-test stage were higher than those in the pre-test stage ( $P < 0.001$ ).

**Table 1.** Group Schema Therapy Sessions

Sessions	Session Content
Prognosis	Planning to form a group; Selection of members; Individually consulting with members before forming a group; Pointing to the requirement for members to attend and participate in group meetings; Introducing the group counseling method; Showing agreement with members when to form a group.
1	Introducing people to each other; Establishing initial communication between group members; Providing the ground for trust; Raising group rules and the important issue of confidentiality; Describing goals; Teaching the concept of schema and schema therapy; Implementing the short form of the Young Schema Questionnaire and Multi-Dimensional Life Story Questionnaire as the task of the next session.
2	Assessing implemented questionnaires; Measuring schemas through mental imagery (presenting the logic of the technique and answering people's questions, performing the technique, and discussing what has happened during the technique); Recognizing and motivating member schemas; Describing mental images of important people in life, including parents, peers, and others who have been involved in forming the schema; Helping members to experience the excitements associated with schemas.
3	Familiarizing members with coping styles (surrender, avoidance, and extreme retaliation); Investigating the types of coping styles in several members of the group; Giving a few examples of coping styles.
4	Performing schema validity test; (a) Collecting objective evidence confirming the scheme; (b) collecting objective evidence refuting the schema; (c) Providing a new definition of schema-confirming evidence.
5	Evaluating the advantages and disadvantages of members' coping responses; Compiling and constructing schema training cards; Introducing and completing the schema registration form.
6	Checking the registration form for schemas and educational cards; Applying the dialogue technique between the "normal aspect" and the "schema aspect".
7	Creating mental imagery; (a) Illustrating childhood; (b) Relating the mental image of the past to the present; (c) Conceptualizing mental image in the form of schemas.
8	Establishing an imaginary conversation with the parents in the session through the empty chair method; Establishing mental imagery to break the pattern; Writing letters to parents as homework.
9	Reviewing homework; Reviewing the conceptualization of members' problems; Further examining the area of disconnection/rejection; Identifying specific behaviors as potential targets for modification.
10	Increasing motivation to change behavior; (a) Relating target behavior to its evolutionary roots in childhood; (b) Reviewing the advantages and disadvantages of continuing the behavior; (c) Preparing educational cards; (d) Practicing normal behaviors through mental imagery and role-playing; Summarizing and reviewing the discussions of previous meetings; Evaluating of the content of the meetings by members; Getting feedback; Running the post-test.

**Table 2.** Mean and Standard Deviation of Somatic Symptom Experience, Medication Adherence, and Perceived Stress Variables in the Experimental and Control Groups<sup>a</sup>

Variables	Experimental Group			Control Group		
	Pretest	Posttest	Follow-up	Pretest	Posttest	Follow-up
Somatic symptom experience	49.60 ± 6.92	42.73 ± 6.65	42.93 ± 6.79	48.06 ± 5.86	47.20 ± 5.55	47.13 ± 5.73
Medication adherence	3.46 ± 1.35	7.40 ± 1.50	6.93 ± 1.62	3.40 ± 1.45	3.60 ± 1.12	3.43 ± 1.40
Perceived stress	47.00 ± 7.04	41.13 ± 7.55	41.40 ± 4.50	44.46 ± 4.29	44.13 ± 4.54	44.60 ± 4.50

Note. SD: Standard deviation. Data are presented as the mean ± SD.

**Table 3.** Repeated Measures ANOVA Results on Somatic Symptom Experience, Medication Adherence, and Perceived Stress

Dependent Variable	Type III Sum of Squares	Degree of Freedom	Mean Square	F	P Value
Somatic symptom experience					
Time	59.82	2	29.91	66.58	<0.001
Time*Group	25.68	2	12.84	28.59	<0.001
Group	66.94	1	66.94	52.24	<0.001
Medication adherence					
Time	176.15	1.24	141.06	107.95	<0.001
Time*Group	220.15	1.24	176.29	134.92	<0.001
Group	100.27	1	100.27	17.91	<0.001
Perceived stress					
Time	643.88	1.10	580.97	355.21	<0.001
Time*Group	599.35	1.10	643.88	355.21	<0.001
Group	1173.61	1	1173.61	13.54	<0.001

Note. ANOVA: Analysis of variance.

Medication adherence in the follow-up stage significantly differed from that in the pre-test stage ( $P < 0.001$ ); however, no significant difference was found between the two post-test and follow-up stages.

## Discussion

The current study attempted to determine the effectiveness of schema therapy on somatic symptom experience, medication adherence, and perceived stress in patients with IBS. The results showed schema therapy was effectiveness on the above-mentioned parameters in patients with IBS, which is consistent with the results of Körük and Özabacı (12) on the effectiveness of schema therapy in the treatment of depressive disorders.

Based on the obtained data, schema therapy could affect somatic symptom experience in patients with IBS. Early incompatible schemas arise from the inability to meet basic emotional needs in childhood – basic needs such as secure attachment to others, self-control, freedom to express healthy needs and emotions, spontaneity, and realistic limitations. At the deepest level of cognition, these schemas usually operate out of consciousness. Schemas always lead to misunderstandings, distorted attitudes, misconceptions, and unrealistic expectations. Furthermore, the human tendency for cognitive

coordination causes situations to be misinterpreted in such a way that schemas are reinforced, emphasizing schema-consistent data. Additionally, data are ignored or underestimated if they conflict with the schema (13). According to the literature, teaching schema therapy and using cognitive and emotional techniques can change the initial incompatible schemas and improve somatic symptom experience by discharging emotions and improving negative emotions and feelings. It can also be pointed out that schema therapy helps the therapist to define chronic and deeper problems and to organize them in a comprehensible approach. Using this model, people can observe their original incompatible schemas as inconsistent, and thus become more motivated to get rid of problems by being aware of their existence (14).

Moreover, schema therapy had an effect on medication adherence in patients with IBS. Given the importance of childhood injuries in patients with IBS and the emphasis of schema therapy on dysfunctional beliefs developed in childhood to adulthood, it uses many principles and techniques (e.g., borderline re-parenting) to reconstruct and modify them. In this regard, it can be indicated that the elements of schema therapy consist of cognitive-behavioral approaches, Gestalt, attachment, object relationships, constructivism, and psychoanalysis in the form of a therapeutic model (15); therefore, it seems logical that schema therapy combines different approaches (attachment and object relationships) as an effective medication model in the treatment of patients with IBS. The primary objective of this psychotherapy model is to create psychological awareness and increase conscious control over schemas, and its ultimate objective is to improve schemas, which improves patient medication adherence. Extensive evidence shows that although schema therapy was originally individual-adjusted, the presence of group factors facilitates the activation of schema therapy techniques and has significant compensatory effects on central schemas such as disconnection/rejection, social isolation, distrust, and emotional deprivation. In fact, due to the close links and interactions between group members, the possibility of real exposure and linking early experiences to the schematic processes here and now in a supportive environment has represented an increase. On the other hand, the sense of self-efficacy and risk-taking of members to perform new behaviors is strengthened by increasing the opportunities for learning succession. Group members also learn to express empathy and meet

**Table 4.** Results of Bonferroni Post Hoc Test for the Comparison of Research Variables

Variables	Time (I)	Time (J)	Mean Difference (I-J)	Std. Error	P Value	95% Confidence Interval	
						Lower Bound	Upper Bound
Somatic symptom experience	1	2	6.87	0.057	0.001	-0.030	0.270
		3	6.67	0.173	0.001	-0.270	0.030
	2	3	-.20	0.096	0.964	0.298	1.147
Medication adherence	1	2	-3.94	0.173	0.001	-1.296	0.389
		3	-3.47	0.162	0.001	-1.201	0.379
	2	3	.47	0.162	0.896	-1.147	0.245
Perceived stress	1	2	5.87	0.001	0.001	-1.159	0.298
		3	5.60	0.001	0.001	-1.154	0.341
	2	3	-0.27	0.157	0.756	-1.284	0.391

their emotional needs in the group instead of leaving their emotions (16). Therefore, the schema therapy scheme can improve the medication adherence of patients according to the results.

The results further revealed that schema therapy has an impact on perceived stress in patients with IBS. Emotional techniques help a person reorganize emotionally, learn new things, regulate interpersonal emotion, and relax itself to use more compatible strategies compared to schemas. Schema therapy helps the patient in the treatment process to create a healthy voice in his mind by questioning the schemas and thus empowering his healthy mentality (13). This therapeutic approach can help people evaluate the correctness of schemas and styles. As a result of applying this approach, individuals view schemas as an external fact that they can fight against using objective and empirical evidence. More precisely, one of the reasons for the success of schema therapy is to target these underlying structures using cognitive techniques (16).

The limited population of research in the city of Tehran limits the generalization of results to other cities. It is also suggested that researchers can use other methods such as interviews to obtain accurate data. Furthermore, it is recommended that a similar study be conducted in other cities so that the results can be compared with those of the present study. It is offered that in future research, other methods such as observation and interview should be used in addition to the questionnaire method.

### Conclusion

Overall, schema therapy was effective on somatic symptom experience, medication adherence, and perceived stress in patients with IBS, and thus can be applied to alleviate psychological problems in patients with IBS.

### Authors' Contribution

All authors participated in the study concept and design, acquisition of data, data analysis, and critical revision of the manuscript for important intellectual content.

### Conflict of Interests

None.

### Ethical Approval

The ethical approval code was IR.HUMS.REC.1398.334.

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### References

- Halmos EP, Biesiekierski JR, Newnham ED, Burgell RE, Muir JG, Gibson PR. Inaccuracy of patient-reported descriptions of and satisfaction with bowel actions in irritable bowel syndrome. *Neurogastroenterol Motil.* 2018;30(2):e13187. doi: 10.1111/nmo.13187.
- Johnsen PH, Hilpüsch F, Cavanagh JP, Leikanger IS, Kolstad C, Valle PC, Goll R. Faecal microbiota transplantation versus placebo for moderate-to-severe irritable bowel syndrome: a double-blind, randomised, placebo-controlled, parallel-group, single-centre trial. *Lancet Gastroenterol Hepatol.* 2018;3(1):17-24. doi: 10.1016/S2468-1253(17)30338-2
- Maagaard L, Ankersen DV, Végh Z, Burisch J, Jensen L, Pedersen N, Munkholm P. Follow-up of patients with functional bowel symptoms treated with a low FODMAP diet. *World J Gastroenterol.* 2016;22(15):4009. doi: 10.3748/wjg.v22.i15.4009.
- Edman JS, Greeson JM, Roberts RS, Kaufman AB, Abrams DI, Dolor RJ, Wolever RQ. Perceived stress in patients with common gastrointestinal disorders: associations with quality of life, symptoms and disease management. *Explore.* 2017;13(2):124-8. doi: 10.1016/j.explore.2016.12.005.
- Pellissier S, Bonaz B. The place of stress and emotions in the irritable bowel syndrome. In: *Vitamins and hormones.* Academic Press. 2017;1(103):25-38.
- Renner F, Arntz A, Peeters FP, Lobbestael J, Huibers MJ. Schema therapy for chronic depression: Results of a multiple single case series. *Journal of behavior therapy and experimental psychiatry.* 2016;51:66-73. doi: 10.1016/j.jbtep.2015.12.001.
- Fassbinder E, Schweiger U, Martius D, Brand-de Wilde O, Arntz A. Emotion regulation in schema therapy and dialectical behavior therapy. *Frontiers in psychology.* 2016;7:1373. doi: 10.3389/fpsyg.2016.01373.
- Maroufizadeh S, Zareiyan A, Sigari N. Psychometric properties of the 14, 10 and 4-item "Perceived Stress Scale" among asthmatic patients in Iran. *Payesh (Health Monitor).* 2014;13(4):457-65.
- Adibi P, Sobhi Gharamaleky N. Effects of relaxation and

- citalopram on severity and frequency of the symptoms of irritable bowel syndrome with diarrhea predominance. *Pak J Med Sci.* 2010;26(1):88-91.
10. Tan XI, Patel I, Chang J. Review of the four item Morisky medication adherence scale (MMAS-4) and eight item Morisky medication adherence scale (MMAS-8). *INNOVATIONS in pharmacy.* 2014;5(3):5. doi: [10.24926/iip.v5i3.347](https://doi.org/10.24926/iip.v5i3.347).
  11. Young JE, Klosko JS, Weishaar ME. *Schema Therapy.* New York: Guilford; 2003. p. 254.
  12. Körük S, Özabacı N. Effectiveness of schema therapy on the treatment of depressive disorders: A meta-analysis. *Psikiyatride Guncel Yaklasimlar.* 2018;10(4):460-70. doi: [10.18863/pgy.361790](https://doi.org/10.18863/pgy.361790).
  13. Schaap GM, Chakhssi F, Westerhof GJ. Inpatient schema therapy for nonresponsive patients with personality pathology: Changes in symptomatic distress, schemas, schema modes, coping styles, experienced parenting styles, and mental well-being. *Psychotherapy.* 2016;53(4):402. doi: [10.1037/pst0000056](https://doi.org/10.1037/pst0000056).
  14. Schinköthe D, Altmann U, Wilz G. The effects of treatment adherence and treatment-specific therapeutic competencies on outcome and goal attainment in telephone-based therapy with caregivers of people with dementia. *Aging & mental health.* 2015;19(9):808-17. doi: [10.1080/13607863.2014.971704](https://doi.org/10.1080/13607863.2014.971704).
  15. Reiss N, Lieb K, Arntz A, Shaw IA, Farrell J. Responding to the treatment challenge of patients with severe BPD: Results of three pilot studies of inpatient schema therapy. *Behavioural and Cognitive Psychotherapy.* 2014;42(3):355. doi: [10.1017/S1352465813000027](https://doi.org/10.1017/S1352465813000027).
  16. Taylor CD, Bee P, Haddock G. Does schema therapy change schemas and symptoms? A systematic review across mental health disorders. *Psychology and Psychotherapy: Theory, Research and Practice.* 2017;90(3):456-79. doi: [10.1111/papt.12112](https://doi.org/10.1111/papt.12112).