A Structural Model for the Prediction of Perceived Social Support Based on Mindfulness and Perceived Stress Mediated by Cognitive Emotion Regulation in Patients with Ulcerative Colitis

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Quantitative Study

Abstract

Background: Ulcerative colitis (UC) is one of the major chronic types of inflammatory bowel diseases (IBD) which can be affected by psychological factors. This study aimed to develop a structural model to predict perceived social support based on mindfulness and perceived stress mediated by cognitive emotion regulation in patients with UC.

Methods: The research method was cross-sectional, correlational. The statistical population of this study consisted of all patients with UC referring to gastrointestinal clinics in districts 4 and 7 of Tehran, Iran, in 2019. Through purposive sampling, 261 people were selected as the study participants. The research instruments included the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1998), Freiburg Mindfulness Inventory (FMI-SF; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006), Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), and Cognitive Emotion Regulation Questionnaire (CERQ; Garnfsky & Craig, 2006). The collected data were analyzed using SPSS software and LISREL software. In addition, data were analyzed using structural equation analysis.

Results: The results demonstrated that mindfulness had a positive relationship with perceived social support and cognitive emotion regulation (P < 0.001). Perceived stress had a negative relationship with perceived social support and cognitive emotion regulation (P < 0.001). There was also a positive relationship between cognitive emotion regulation and perceived social support in patients with UC (P < 0.001). The findings also suggested that there was an indirect relationship between mindfulness and social support mediated by cognitive emotion regulation (β = 0.22; P < 0.05), but there was no indirect relationship between perceived stress and perceived social support mediated by cognitive emotion regulation (β = 0.09; P > 0.05).

Conclusion: It can be concluded that cognitive emotion regulation has a mediating role between mindfulness and perceived social support in patients with UC. Although there were direct relationships between perceived stress, perceived social support, and cognitive emotion regulation, there was no indirect relationship between perceived stress and perceived social support mediated by cognitive emotion regulation in patients with UC.

Keywords: Cognitive emotion regulation; Mindfulness; Perceived social support; Perceived stress; Ulcerative colitis

Introduction

Inflammatory bowel disease (IBD) is a group of idiopathic and chronic intestinal diseases including Crohn's diseases (CD) and ulcerative colitis (UC) that is limited to the large intestine (Chiba, Sugawara, Komatsu, & Tozawa, 2018). In 2012, the annual incidence of UC in Iran was reported at 3.11 per 100,000 people (Mohajerani, Haghayegh, & Adibi, 2017). The etiology of IBD is largely unknown; however, the confirmed hypothesis behind this is that the disease is caused by interactive genetic and environmental factors. Substantial progress has been made in identifying the genes responsible for the development of the disease, but the environmental factors causing early onset and recurrence are less known (Kemp et al., 2018). Perceived stress is thought to be one of the most important environmental factors in relation to the of IBDs, on which many types of research have been conducted. The term stress was first introduced by Hans Selye, who stated that the gastrointestinal tract and immune system in individuals are particularly responsive to life stresses (Parian & Limketkai, 2016). People's cognitive evaluations of stress and the enjoyment of supportive resources that enable them to cope with environmental stresses are referred to as social support. This term refers to the mechanisms by which interpersonal communication protects people from the harmful effects of stress (Ghorbani Taghlidabad & Tasbihsazan Mashhadi, 2017).

Support and good social relations contribute significantly to increasing health, especially the health of patients with UC. This is because social support has been very promising and helpful in creating and materializing the real and emotional needs of people and that is why belonging to social networks within the community and consideration of mutual needs make people feel respect, value, love, and friendship (Xie et al., 2018). It also improves the survival and psychological well-being of people (Wong, Wu, Gregorich, & Perez-Stable, 2014); however, perceiving support is more important than receiving it. In other words, the perception and attitude of patients with UC towards the support they receive is far more important than the amount of support provided (Mohamad, Alavi, Mohamad, & Aun, 2016).

In the area of mental health, mindfulness is another variable that has received much attention in recent decades. Because of its underlying mechanisms such as acceptance, increased awareness, desensitization, presence the moment, and observation without judgment, mindfulness can reduce the symptoms and consequences of the disease, increase the effectiveness of treatment, and prevent the recurrence of suicidal ideation in people (Hsu, Grow, & Marlatt, 2008). Using mindfulness-based exercises, the individual learns to provide alternative responses to emotional inconveniences and reduce conditioned responses. Mindful individuals learn to accept experiences as distinct experiences and as a transient and thematic state of change (Witkiewitz & Bowen, 2010). According to previous research, balanced meditation, mindfulness meditation, Vipassanā meditation, yoga, and other meditation techniques have had impressive effects on improving the rehabilitation of the clients. Studies have suggested that mindfulness therapy is associated with a variety of health outcomes such as reducing pains, anxiety, depression (Hoffman & Gómez, 2017), and stress (Carpenter, Sanford, & Hofmann, 2019). Another research demonstrated that mindfulness improves mood, and its short-term training reduces depression and increases clients' mental health (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010). Moreover, mindfulness was found to improve symptoms of stress and anxiety, and increase self-esteem and quality of life (QOL) (Goldin & Gross, 2010).

One of the most prominent strategies for examining the problems related to emotion processing and regulation is cognitive emotion regulation. Cognitive emotion regulation refers to some strategies to reduce, increase, or maintain emotional experiences (Moghaddam Poor & Sepahvand, 2018). Cognitive emotion regulation is the intrinsic aspect of tendencies towards emotional responses. Cognitive emotion regulation is the activities used to change or modify an emotional state. According to the study by Ghorbani Taghlidabad and Tasbihsazan Mashhadi (2017), people with UC suppress many of their emotional experiences and express more negative emotions and social inhibition. Emotional inhibition and negative emotions increase cortisol secretion, increase the activity of the hypothalamic-pituitary-adrenal axis, and impair the regulation of physiological responses to stress, all of which cause gastrointestinal symptoms (Trindade, Ferreira, & Pinto-Gouveia, 2015). A mature personality with high cognitive-emotional regulation power avoids emotion suppression and inhibition, identifies the source of his/her problems and conflicts, seeks to resolve them, and incurs no costs on healthcare (Hood et al., 2018).

Unofficial reports suggest a significant rise in the prevalence of IBDs such as UC in Iranian society (Mohajerani et al., 2017). The disease incurs high costs and the drug treatment alone has not had much effect on reducing symptoms and increasing the life function of gastrointestinal patients. In addition, IBD is a chronic disease and persists for a long time, which is an indication of psychological factors in the etiology of the disease. Hence, it is critical that research of this kind be performed to reduce its psychological and physical symptoms. Concerning the applications of this research, one would argue that, at present, inter-disciplinary relationship has been one of the factors for the success and progress of this body of knowledge. The cooperation of experts of internal medicine, i.e., gastroenterologists, with psychologists and psychiatrists can have more effects on patients with UC, and since UC is closely related to psychological components, this seems necessary. Moreover, most researches have demonstrated that psychological therapies along with medical therapies can have great positive effects on the symptoms of UC, and thus, reduce the cost of treatment for these patients. Since UC is on the rise in developing countries and psychological variables play an undeniable role in the development and persistence of this disease, all mental aspects should be taken into account in the treatment of these patients. This will certainly help these patients improve their QOL and reduce the psychological, physical, economic, and social pressures caused by this disease. Considering the importance of relationships between psychological factors affecting patients with UC and given that there has so far been no research to examine the above-mentioned variables in a structural model, this study was conducted to examine the mediating role of cognitive emotion regulation in the relationship of mindfulness and perceived stress with perceived social support.

Methods

The present study was conducted with the aim to provide a structural model to predict perceived social support based on mindfulness and perceived stress mediated by cognitive emotion regulation in patients with UC. The data were collected through a descriptive-correlative method via structural equation modeling. The statistical population consisted of all patients with UC referring to gastrointestinal clinics in districts 4 and 7 of Tehran, Iran, in February and March 2020. This research was conducted via a purposive sampling method. In structural equation modeling, the sample size can be determined between 5 and 15 observations for each measured variable: 5q <n <15q, where q represents the number of variables observed or the

questionnaire items (questions) and n is the sample size (Hooman, 2005). In this study, 5 subjects were considered for the sample size of each item, thus totaling 241 subjects. However, since many of the questionnaires were likely to be incompletely answered, it was decided to include 270 participants in the study, and finally, 261 completed questionnaires were returned. The questionnaires completed by people with UC were examined. The study inclusion criteria were having a minimum literacy to understand the questionnaire items diagnosis of UC based on the views of gastroenterologists and the results of endoscopic, histological, and radiological examinations in the studied group. The exclusion criteria included leaving 10% of the items unanswered and patients' unwillingness to continue participating in the study. Participating in this research was optional and all participants were free to quit at any time. The identities of the participants in this research were kept confidential.

Multidimensional Scale of Perceived Social Support: The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988) measures an individual's perceived social support from friends and family. This scale was developed by Zimet et al. (1988) to measure the level of perceived social support from friends, family members, and important individuals in one's life. The scale consists of 12 items that are scored based on a 7-point Likert scale ranging from strongly disagree to strongly agree. The total questionnaire score is obtained by summing up the item scores. In this scale, the minimum score is 12 and the maximum is 84. The Cronbach's alpha coefficient has been reported between 0.71 and 0.89. Salimi et al. (2009) reported the Cronbach's alpha coefficient of the 3 dimensions of social support from family, friends, and important people in one's life to be 0.89, 0.86, and 0.82, respectively.

Freiburg Mindfulness Inventory: The short form of the Freiburg Mindfulness Inventory (FMI-SF; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006) has been extensively examined in many cultures for its psychometric properties (Ghasemi Jobaneh, Arab Zadeh, Jalili Nikoo, Mohammad Alipoor, & Mohsenzadeh, 2015). Buchheld et al. (2001) designed the initial form of the FMI with 30 items (Walach et al., 2006). In this inventory, subjects are asked to answer the items on a 4-point Likert scale (rarely = 1 to almost always = 4). The minimum score in this questionnaire is 14 and the maximum is 56. A higher score indicates higher mindfulness. Ghasemi Jobaneh et al. (2015) investigated the validity and reliability of the Persian version of the FMI-SF. Their findings suggested that the FMI-SF has acceptable and sufficient reliability. In addition, its Cronbach's alpha coefficient was reported to be 0.92, and its test-retest reliability coefficient in a 4-week interval was 0.83.

Perceived Stress Scale: The 4, 10, and 14-item versions of the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) are used to measure general perceived stress over the previous month. This form examines responses to assess thoughts and feelings about stressful events, controlling, overcoming, and coping with mental stressors and experienced stress. Each item is scored on a Likert scale ranging from 0 to 4, i.e., never (0), almost never (1), sometimes (2), often (3), and most of the time (4). Items 4, 5, 6, 7, 9, 10, and 13 are scored in reverse (never = 4 to most of the time = 0). It has a cut-off point of 21.8, and higher scores indicate more perceived stress. Cronbach's alpha for this scale in 3 studies was found to be 0.84, 0.85, and 0.86 (Sanaei et al., 2017).

Cognitive Emotion Regulation Questionnaire: The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, & Kraaij, 2006) is an 18-item scale that evaluates self-regulatory strategies in response to life-threatening and stressful events. The

items are scored on a 5-point Likert scale ranging from 1 (never) to 5 (always). The CERQ includes the 9 subscales of self-blame, other-blame, rumination, catastrophizing, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, and acceptance. A higher score in each subscale indicates more use of that cognitive strategy. The alpha coefficients for the subscales of this questionnaire ranged from 0.71 to 0.81 and the validity coefficients of its subscales were reported to range from 0.48 to 0.61 via test-retest. In Iran, the alpha coefficients of the subscales were reported to range from 0.62 to 0.91 and the validity coefficients of these subscales ranged between 0.75 and 0.88 in a 1-week interval test-retest (Abdullahi et al., 2013).

Having obtained permission from the Research Council, the researcher presented a letter of introduction to the gastrointestinal clinics in Tehran, introduced himself, obtained informed consent, and provided the necessary explanations. Then, participants were selected considering the inclusion and exclusion criteria. Subsequently, the questionnaires were distributed among the selected subjects and were collected after being completed. It is worth noting that the necessary explanations about the objectives of the study, voluntary participation, privacy, confidentiality, non-registration of identification details, the right to withdraw from all stages of data collection in the study, and subjects' consent to participate were provided to the participants. In order to comply with the ethical principles of research, a consent form was provided in which the objectives of the research were explained in full. Participants were asked to read it, and express their consent and indicate if they wished to participate in the research. In order to analyze the data, descriptive and inferential statistical methods were used according to the research questions.

In the descriptive part, descriptive statistics such as mean and standard deviation were used to describe the research variables, and tables, shapes, and graphs were used to present the demographic data. In the inferential section, to answer the research hypotheses, first, the Kolmogorov-Smirnov test was used to determine the normality of the data, and since the data were found to be normal, the structural equation modeling test was performed using LISREL software (version 8.80).

Results

The sample consisted of 147 women (56.32%) and 114 men (43.68%) of 35-65 years of age with the majority being 46-55 years of age (39.08%).

The results presented in table 2 show that among the dimensions of cognitive emotion regulation, the highest mean belonged to mindfulness. The results of implementation of the model in the standardized mode and non-standardized mode along with some of the most important initial model path analysis fit indices are presented in the following table 1 and figure1.

The correlation matrix between the predictive variables shows that all variables are significantly correlated.

The results presented in table 3 suggest that the correlation of all 3 predictive and mediating variables with perceived social support is significant.

Table 1. Frequency distribution of the study sample by age

Statistical indicator	n (%)
Age (years)	
35-45	76 (29.12)
46-55	102 (39.08)
56-65	83 (31.80)
Total	261 (v)

Table 2. Descriptive findings of research subscales

Statistical indicators	Mean ± SD	Kurtosis	Skewness
Scales			
Mindfulness	28.89 ± 5.77	1.20	2.28
Perceived Stress	20.36 ± 4.11	0.67	6.41
Self-blame	5.67 ± 1.48	0.50	-0.79
Other-blame	6.02 ± 1.33	-1.27	0.59
Catastrophizing	6.78 ± 1.64	-0.28	-1.80
Rumination	6.34 ± 1.08	-2.54	7.36
Acceptance	6.06 ± 1.33	-0.74	0.58
Positive refocus	6.19 ± 1.48	-0.37	-0.99
Planning	6.74 ± 1.52	-0.94	-0.43
Positive reappraisal	5.54 ± 1.07	2.90	8.58
Putting into perspective	6.10 ± 1.30	-1.86	2.10
Family support	12.70 ± 3.69	-1.14	0.09
Friends support	14.68 ± 1.19	-2.75	2.95
Support by important individuals in one's life	13.44 ± 2.77	-1.63	1.89
Perceived Social Support	40.82 ± 5.66	-1.24	1.69

In general, when working with the Amos software, each of the obtained indicators alone does not represent the fitness or unfitness of the model, as they should be interpreted together. The values of indicators show that the model is generally in a good position to be explained.
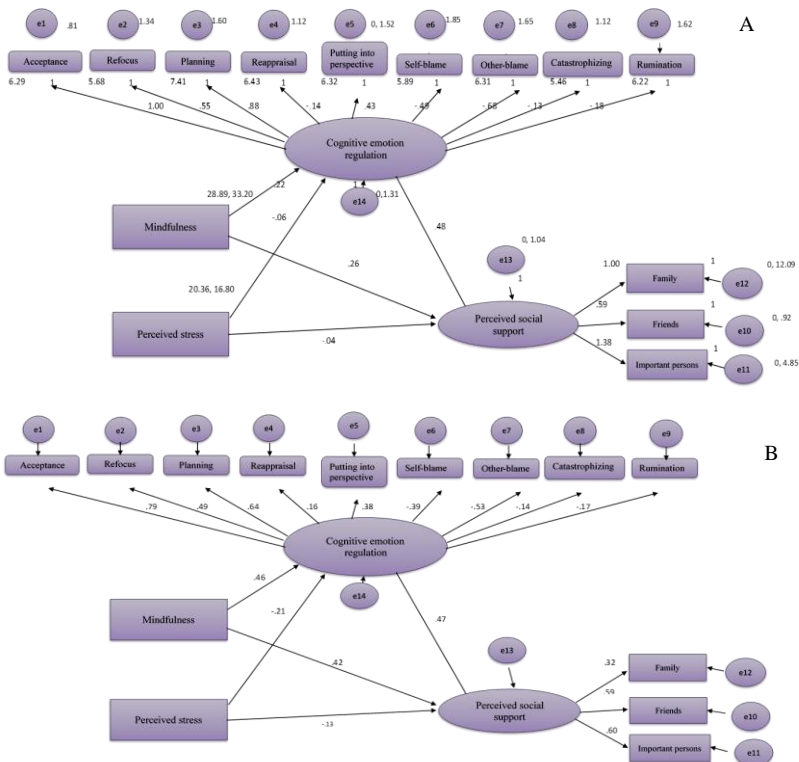

Figure 1. Model in a non-standardized coefficients state (A), Model in a standardized coefficients state (B)

Table 3. Pearson correlation matrix between the research variables

Variables	Mindfulness	Perceived stress	Cognitive emotion regulation	Social support
Mindfulness	1			
Perceived stress	-0.18*	1		
Cognitive emotion regulation	0.37**	-0.16*	1	
Social support	0.49**	-0.24**	0.52**	1

**P < 0.01, *P < 0.05

As table 5 shows, the factors of both factorial load scales are significant at 95%. Considering that in the above tested models the paths between the variables are the same as the research hypotheses, other research hypotheses are tested along with the tables on direct effects.

Table 6 shows that mindfulness has a direct effect on perceived social support, where the relationship between mindfulness and perceived social support is directly equal to t = 5.83 and β = 0.42.

The relationship between perceived stress and perceived social support is directly equal to t = 2.04 and β = -0.13. The relationship between mindfulness and cognitive regulation of emotion is directly equal to t = 6.71 and β = 0.46. The relationship between perceived stress and cognitive emotion regulation is directly equal to t = 2.96 and β = -0.21. The relationship between cognitive emotion regulation and perceived social support is directly equal to t = 7.18 and β = 0.47. Regarding the indirect effect of perceived stress on perceived social support in patients with UC, cognitive emotion regulation is rejected with 95% confidence (P > 0.05).

Discussion

The aim of the present study was to develop a structural model for predicting perceived social support based on mindfulness and perceived stress with a mediating role of cognitive emotion regulation in patients with UC. The results showed that mindfulness and perceived stress had a relationship with perceived social support mediated by cognitive emotion regulation in patients with UC and the model was confirmed to have a good fit.

Table 4. Goodness of fit indices for a fitted conceptual model

Fitness Indices	χ^2/df	RMSEA	AGFI	GFI	CFI
Structural model	1.25	0.05	0.94	0.95	0.96

RMSEA: Root mean Square error of approximation; AGFI: Adjusted goodness of fit index; GFI: Goodness of fit index; CFI: Comparative fit index; RMSEA: Root mean Square error of approximation

Table 5. Coefficients and significance of factor loads of measurement models

Scales	Component	β	T-value	P-value
Cognitive emotion regulation	Acceptance	0.79	10.84	0.001
	Positive refocus	0.49	17.36	0.001
	Planning	0.64	14.31	0.001
	Positive reappraisal	0.16	56.92	0.001
	Putting into perspective	0.38	24.11	0.001
	Self-blame	-0.39	19.70	0.001
	Other-blame	-0.53	15.63	0.001
	Catastrophizing	-0.14	51.20	0.001
	Rumination	-0.17	44.24	0.001
Perceived social support	Support by family	0.33	12.45	0.001
	Support by friends	0.59	31.23	0.001
	Support by important people	0.60	10.52	0.001

Table 6. Coefficients and significance of the direct effect of mindfulness on perceived social support

Criterion variable	Predictive variavble	Effect type	Non-standardized coefficient	β Standardized	Significance value	P-value
Perceieved social suport	Mindfulness	Direct	0.26	0.42	5.83	0.001
Perceieved social suport	Perceived stress	Direct	-0.04	-0.13	2.04	0.030
Cognitive emotion regulation	Mindfulness	Direct	0.22	0.46	6.71	0.001
Cognitive emotion regulation	Perceived stress	Direct	-0.06	-0.21	2.96	0.002
Perceieved social suport	Cognitive emotion regulation	Direct	0.48	0.47	7.18	0.001
Perceieved social suport	Mindfulness	Mediated by cognitive emotion regulation	0.11	0.22	2.58	0.008
Perceieved social suport	Perceived stress	Mediated by cognitive emotion regulation	-0.03	-0.09	1.72	0.090

In line with previous researches, the results showed that mindfulness has a negative relationship with perceived stress, which means by increasing mindfulness, perceived stress decreases. This implies that using methods to increase mindfulness can reduce perceived stress in individuals with UC and ultimately improving their QOL. Furthermore, mindfulness had a positive relationship with emotion regulation in patients with UC. Consistent with prior researches, it was found that when people are in a state of mindfulness, increasing their capacity to accept thoughts and emotions will leave them no opportunity for absorbing negative and dysfunctional thoughts and attitudes, thereby reducing their emotional processing and dysfunctional attitudes and increasing their ability to regulate their emotions more efficiently.

The results also showed that perceived stress has a direct effect on perceived social support in patients with UC. In this regard, it is generally believed that having supportive systems, such as families, work groups, and communities, facilitates stress coping strategies. It has been assumed that social support acts as a mediator between life pressures and physical conditions. The results of the present study revealed that social support is effective in reducing stress in patients with UC, and that increasing social support decreases the level of stress in these people. The results also demonstrated a positive relationship between perceived stress and emotion regulation. It has been argued that affects and emotional disturbances have a biological relationship with stress symptoms. These results can be explained by the fact that patients with UC experience increased intensity of emotion when faced with daily stressful situations, which increases the intensity of stress. The strategies used by patients with UC to reduce their negative emotions can exacerbate the emotions and lead to a kind of emotional dysregulation. When patients with UC try to reduce their emotions, especially their negative emotions, through suppressing and preventing the expression of emotions, especially negative emotions, they intensify them.

A positive relationship has been observed between emotion regulation and perceived social support. It has been shown that social support helps to reduce the perception of stress by influencing the choice of effective or ineffective coping with negative emotions. As researches have shown that cognitive functioning and adaptive strategies can be improved by social supports (Amin Abadi, 2011), it can be argued that receiving social supports from families and friends can help patients with UC to use more adaptive strategies to regulate their emotions.

The results also showed that there is an indirect relationship between mindfulness and perceived social supports via emotion regulation among these patients, which did not apply to the relationship between perceived stress and perceived social support. The results of some studies have also shown that lack of support makes a person vulnerable to psychological consequences such as stress. Perceived support, as an important variable of the social system in critical situations, reduces stress and causes emotional regulation. Thus, the lack of support in these stressful situations and during a disease experience imposes much pressure on the person, causes psychological consequences such as stress, reduced emotional regulation, and renders an individual highly vulnerable to stress. As different mindfulness technics can help patients to pay more attention to the changes in their body sensations and make them more aware of their physical problems, they can help them to find better ways to manage their emotions, and therefore, have more positive insight into their perceptions such as perceived social supports.

This study faced some limitations including limited sample of patients with UC; therefore, it is rational to only generalize the results to the target community, and caution should be taken in generalizing of the results to other communities. Data were collected using self-report questionnaires that may produce response biases. The data collection and analysis in the present study were cross-sectional, and therefore, a causal conclusion cannot be made about the data; thus, it is better to conduct a longitudinal research in this area. The results showed that mindfulness and perceived stress had a relationship with perceived social support mediated by cognitive emotion regulation in patients with UC. Therefore, it is suggested that training courses be held with health psychologists on the application of emotions in the lives of people with UC. According to this study and the confirmation of the relationship between stress and UC and the undeniable role and impact of psychological factors and psychiatric disorders in functional intestinal diseases, a series of experiments should be performed to yield good results.

It is recommended that these patients consult psychologists and counselors. Moreover, the use of stress reduction techniques such as relaxation, social support, breathing exercises, regular exercise, meditation, hypnosis, and biofeedback can be suggested. It is recommended that patients with UC use mindfulness-related methods and techniques to improve emotional regulation. The findings of the present study demonstrate the need for emotion and stress management programs along with common treatment programs in patients with UC. Accordingly, studies on perceived stress with respect to the underlying variables of prediction with a transformational approach, etiology, and phenomenal understanding, make it possible to provide comprehensive programs and appropriate interventions.

Conclusion

It can be concluded that training patients mindfulness technics, stress management, and emotion regulation can help them to establish stronger and healthier relationships and benefit more from social supports.

Conflict of Interests

Authors have no conflict of interests.

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