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Perceived Social Support and Depression in Inflammatory Bowel Disease Sufferers: Mediating Role of Illness Perception and Coping Strategies

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***ABSTRACT**--Inflammatory bowel disease (IBD), as a chronic disorder in gastrointestinal system, affects various aspects of the individuals' life. A vast majority of individuals with IBD suffer from depression signs more than general population. This study was designed to investigate appropriateness of a structural model of depression assessment, based on Perceived Social Support, and mediating role of illness perception and coping strategies.In a correlational study, 268 IBD patients were selected by purposive sampling from the Clinic of Liver and Digestive Research Center of Qom province. They completed the BDI-PC depression scale, Coping Strategies Questionnaire, Illness perception Questionnaire (short form), and Perceived Social Support scale. Data were analyzed through Lisrel software by the structural equation modeling.significant other and friends domains of Perceived Social Support can through Illness perception and coping strategies, predict depression in patients with inflammatory bowel disease. But are not able to directly determine of depression variance and is not significant.In conclusion, findings support mediating role of illness perception and coping strategies between Perceived Social Support and depression in IBD Patients*

***Keyword**-- Inflammatory Bowel Disease, Depression, Perceived Social Support, Illness Perception, Coping Strategies*

I. INTRODUCTION

According to the World Health Organization (2008), the prevalence of chronic and non-communicable diseases is increasing in all countries, especially developing countries. (1). One type of chronic diseases is inflammatory bowel diseases. Inflammatory bowel disease is a general term for a series of chronic gastrointestinal diseases with frequent and unpredictable periods of recurrence and latency. Ulcerative colitis and Crohn's disease are two of the most common ones. In these diseases, there are transient and temporary changes in intestinal mucosal inflammation that are close to normal in the period of latency and severely wounded during recurrence. These diseases are physically serious and disabling. The main symptoms of ulcerative colitis are diarrhea, rectal bleeding, mucosal drainage, and abdominal cramps and pain. Crohn's disease manifests as acute or chronic inflammation of the bowel including periods of recurrent pain and diarrhea, and severe weight loss. The onset of the disease is often in early adulthood and peaks around the age of 20–33 years, and the ratio of women to men is also equal (2). Up to now,

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there has been no definitive cure for inflammatory bowel disease, and since life expectancy in these patients is approximately the same as normal, the affected patients should spend the rest of their life with a chronic, unpredictable, and disabling disease. Therefore, psychological well-being and quality of life of these patients are often affected and different aspects of their lives are influenced. A patient who receives a diagnosis of inflammatory bowel disease experiences various emotions such as denial, hostility, hopelessness, and sadness (3). Depression is more commonly associated with inflammatory bowel disease (IBD) than might be expected (4, 5,6). Depression (in inflammatory bowel patients) is believed to be partly due to a combination of the following:

Experience of various levels of pain, awareness of lack of a definitive treatment, fear of uncontrolled bowel control, and unpredictability of the disease, (Quoted from (1). More than 23% of people with IBD develop symptoms of depression after diagnosis. About 9% of these people have suicidal thoughts (7,8). A study in 2015 showed that depression increased in patients with IBD from diagnosis until 6 months afterwards.(9)

Several factors, such as their coping strategies, affect the psychological status of chronic patients. Coping strategies can be considered as the way that one behaves or a person has to deal with stress. Numerous studies have found that coping strategies of people with stress due to diagnosis and perception of their disease are mediating factors affecting their psychological well-being including depression. Coping strategies can be divided into three categories: Problem-focused coping strategies (e.g. planning, seeking support), emotion-focused coping strategies (such as seeking emotional support, acceptance), and avoidance-focused coping strategies (eg, alcohol use, emotion drain). Problem-focused and emotion-focused coping strategies yield favorable outcomes, compared to avoidance coping ones. (10). In a study, conducted by McCombie et al. in 2015, a significant relationship was reported between depression, after IBD diagnosis in these patients, and the use of maladaptive coping strategies (9). Also, according to the World Health Organization (WHO), the decline in quality of life in IBD patients is related to patients' coping strategies and their perceptions of their disease (11). In Year 2012, a study concluded that people with IBD use passive coping strategies more frequently than active strategies such as reassessment (4).

Studies on the relationship between social support and health have shown that people with high levels of social support have better health, and lack of social support is a more important risk factor for chronic illness (12) . Cohen (2004)(13) defines social support as: social support is a social network that provides individuals with psychological and specific resources (13). Social support has been known as the strongest and most powerful factor in chronic patients' successful coping with their chronic diseases and facilitates their tolerance of the problems. It, through its mediating role between stressors in life and physical and mental disorders, enhances patients' understanding of their disease and alleviates the problems, experienced by these patients, enhances their survival, recovery, and health status, and ultimately, leads to their quality of life modification (14). Social support is one of the aspects of quality of life that IBD patients need to address. Social support has been used as adjunctive therapy in several chronic diseases such as arthritis, cancer, AIDS and alcoholism. More social support is usually recommended for a satisfying effect on chronic diseases. Social support is also used in IBD, but has yielded controversial results.(15) In a study by Maida et al (2001)(16), the relationship between IBD patients' interaction, perception, their stress levels and their level of satisfaction with social support was found to be statistically significant. They concluded that social support may strongly influence the concerns of patients with IBD. On the other hand, this study points to the study of Maunder et al (2001)(17), which found no improvement in quality of life in a group of patients with IBD who received social and psychological support for 20 consecutive weeks. There is no theoretical consensus

on how to provide social support, and whether social support affects quality of life and reduces the suffering of patients with IBD or not. Whether the disease itself is a risky issue and acts as an obstacle between the individuals and the network around them is also an ambiguous issue.

In 2006, a team of Canadian researchers Maunder et al (18) investigated the relationship between inflammatory bowel disease and quality of life in 388 patients. These people were ill since 1999. Their study showed that 74% of people with Crohn's disease and 66% of people with ulcerative colitis in active phase for 6 months had higher levels of anxiety and health depression, and lower levels of social support and quality of life, compared to those with passive phase of the disease (19). *Miehsler* et al (2008) (20)found that there was a significant relationship between coping strategies with depression in IBD patients. They also found that the lower the level of social support and the higher the use of none efficient coping strategies are, the greater the risk of depression in IBD is. Depression is more common in patients with IBD than in the general population (5). Despite much research on IBD, the relationship between IBD and depression after diagnosis is still unclear, which may be due to the conceptual and methodological weaknesses. The purpose of the present study was to present a structural model for explaining depression after diagnosis of IBD, based on perceived social support and the mediating role of disease understanding and coping strategies.

II. METHOD:

The study population of the present study consisted of 5 IBD patients referring to a doctor's office in the second half of the year 2017and the first half of the year 2018 with a maximum of 6 months after their diagnosis. A number of patients with inflammatory bowel disease were selected through convenient sampling. The tools needed for this study were

BDI-PC Questionnaire*:* Beck Depression Scale for Primary Care for Medical Patients (PC-BDI: This questionnaire was developed by Beck et al. Through excluding physical health items, from the original questionnaire, it was used in prospective medical centers in screening the patients to minimize the false reports of depression among the patients with physical disorders. Previous studies have demonstrated the superiority of this instrument to the Hospital Anxiety Depression Scale. It has a 7-item questionnaire, each focusing on a depression sign. The items in this scale coincide the DSM-IV criteria to diagnose clinical depression. The severity of each sign is expressed in four expressions. The expressions of each item are scored between 0-3. Score 0 in each item shows absence of that sign and 1-3 show the severity of that sign. The maximum score on this scale is 21. The psychometric properties of this scale have been studied in several studies and have shown that this scale is effective in screening depression in physically impaired patients. The psychometric properties of BDI-PC scale were studied separately in Iranian subjects. Cronbach's alpha of 0.88 was obtained as the internal consistency of this scale in a sample of 176 subjects. Also, the weekly interval test re-test results of this scale in a sample of 62 heart patients showed a validity coefficient of 0.74. In addition, the construct validity of this scale was 0.87, compared with the Depression Scale subscale of the Iranian version of the Hospital Anxiety Depression Scale in 140 of the patients in the study sample. Also using structured clinical interviews, according to the IV-DSM criteria in the above subjects, the cut-off point was obtained with sensitivity of 0.84, specificity of 0.97 and maximum clinical efficiency coefficient of 0.91 to screen clinical depression including major and minor depression. (21).

The Strategic Stress or Mental Pressure Coping Questionnaire is defined as an integrated biological and psychological response to stressors that disrupt biological and psychological balance and cause a threat with challenges. Being in a state of stress is so uncomfortable that it can cause people either to rectify or to cope with the stressor. Therefore, it is inevitable to use coping styles or strategies to return to previous normal condition or to return to an equilibrium point. Coping is the process of managing stresses that strain a persons' resources and cause them to manage external and internal demands (22). For the Coping Strategies Scale, we used the Short Form Illness Perception Questionnaire that has 21 questions (22).

Short Form Illness Perception (IPQ): The Short Form Illness Perception Questionnaire (IPQ) was used to assess illness perception. This scale is a summarized version of the Illness Perception Scale that covers all of the cognitive dimensions, put forward by Leventhal self-regulation theory. Cronbach's alphas were reported from 0.71 to 0.84 (23). In addition to its comprehensiveness and brief form, the ability to assess illness severity perception is among its advantages. The main goal to adopt such a scale has been to assess the patients' perception of their illness severity. Iranian version of the illness perception questionnaire has been localized with appropriate validity and reliability (24).

Perceived Social Support Scale: This scale, developed by Zimet et al. (1988), consists of 12 questions and 3 subscales, scored on a 5-point Likert scale ranging from "strongly disagree to strongly agree". The family subscale includes questions 3, 4, 8, and 11, friends subscale includes questions 6, 7, 9, and 12, and important persons subscale includes questions 1, 2, 5, and 10. Afshari (2007)(25) found a positive and significant relationship between the scores of this scale and its subscales with life satisfaction indicating convergent and divergent validity of the scale. In the sample under study, internal consistency through Cronbach's alphas for the whole scale and family, friends and important persons were calculated as 0.90, 0.92 and 0.87, respectively. The total score of the scale is obtained by summing up the scores of the questions. The minimum score for the subjects is 12 and the maximum is 60. Higher scores indicate higher perception of social support (26).

III. DATA ANALYSIS

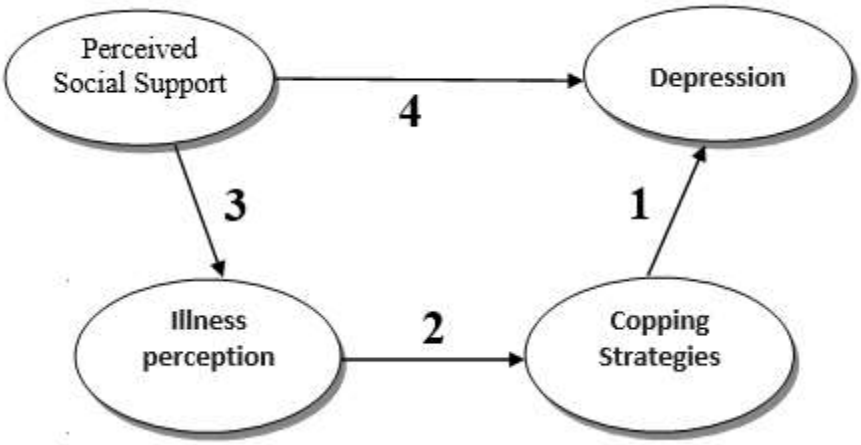

Figure 1: conceptual model to explain depression

In order to examine the above conceptual model, structural relationships between various variables will be scrutinized separately first, and later they will all be analyzed as a whole. Numbers written down on each path in figure 1, indicates sequences of relationships to be analyzed.

Methodology: The statistical population was comprised of 269 IBD patients (155 men and 114 women, out of which 122 patients had a diploma and 147 patients had a bachelor's degree), referring to the Clinic of Liver and Digestive Research Center of Qom in the second half of 2018 and the first half of 2019, with a maximum of 6 months from diagnosis. The participants with IBD were selected by purposive sampling method. Regarding the ethical concerns, participants were asked to study the aims of research and all participants completed the consent forms before participation. The instruments used in this study were:

IV. DATA ANALYSIS

Structural equation modeling was used to examine conceptual models hypothesized by researcher. In all models post- IBD depression entered as final ETA and Perceived Social Support as KSI. Copping strategies entered as final ETA in 2nd model and as mediator ETA in 5th model. Illness perception entered as final ETA in 3nd model and as mediator ETA in 5th model. Several goodness of fit indexes were used in all models.

V. RESULTS

As indicated in Figure 1, this model consists of 4 parts identified by numbers 1, 2, 3 and 4. Hence first each component has been examined through 4 different hypotheses, and later the model was evaluated wholly.

1) Coping strategies predict depression in patients with inflammatory bowel disease

As it appears in Table 1, the above model has an acceptable goodness of fit. As the coefficient correlations are indicated on the paths, coping strategies determine overall.%53 of depression variance; with emotion-focused strategy having a positive correlation with depression predicting 46% of it, problem-focused strategy with negative correlation -42%, and avoidant strategy having a positive correlation 12%. Altogether, results indicate that coping strategies, specifically emotion-focused and then problem-focused strategies have significant impact on depression in patients with inflammatory bowel disease.

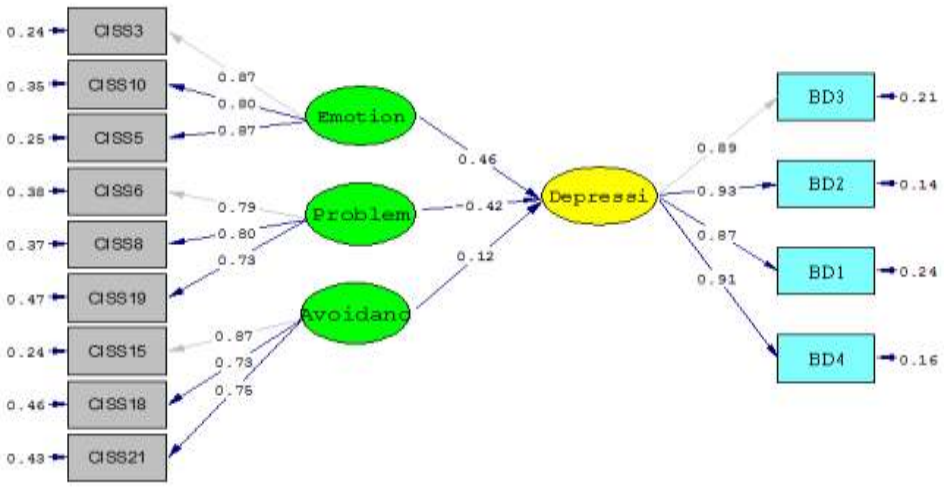

Figure 2: Sectional structural relationship between coping strategies and depression

Table 1: Model›s Indexes of Goodness of Fit

SRMR	RMSEA	AGFI	GFI	IFI	NFI	CFI	Chi/df	Df	χ^2	P
0/05	0/04	0/83	0/89	0/99	0/97	0/99	1/62	59	96	0.0013

2) Illness perception, directly predicts coping strategies in patients with inflammatory bowel disease.

The model holds an acceptable goodness of fit, but the path from Illness perception to avoidance strategy is not significant (T = -1.47). illness perception has a positive correlation with emotion-focused variance and determines 64% of it; meaning the more negatives the perception, the more the patient applies emotion-focused strategies. Illness perception has negative correlation with problem-focused strategies and determines -40% of it; it also has negative correlation with avoidance variance predicting -11% of it. Hence when the negative perception intensifies, the patient exploits more of problem-focused and avoidance-focused strategies. Therefore illness perception in patients with inflammatory bowel disease , predicts coping strategies specifically emotion-focused strategies significantly.

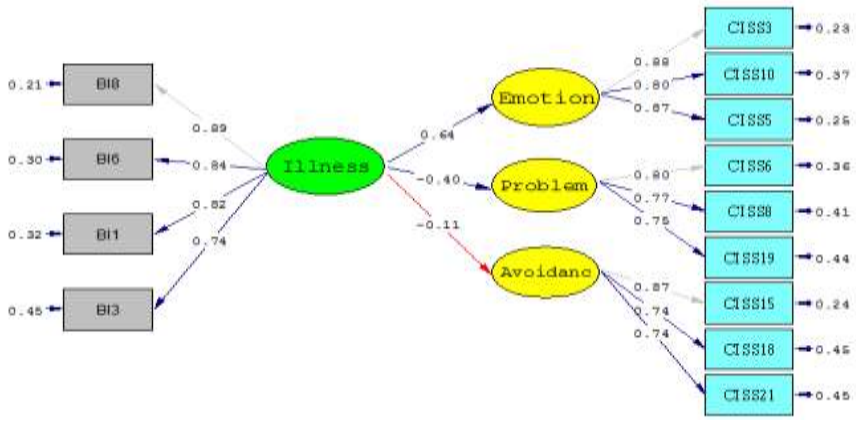

Figure 3: Sectional structural relationship between illness perception and coping strategies (the red line means related path is not significant)

Table 2: Model's Indexes of Goodness of Fit

SRMR	RMSEA	AGFI	GFI	IFI	NFI	CFI	Chi/df	Df	χ^2	P
0/07	0/04	0/88	0/92	0/99	0/97	0/99	1/50	62	93	0.0059

3) Perceived Social Support can directly predict Illness perception in patients with inflammatory bowel disease.

The model holds an acceptable goodness of fit, but the path from family domain of **Perceived Social Support** to Illness perception is not significant (T = -.26). As the coefficient correlations are indicated on the paths, friends

Perceived Social Support has a Negative correlation with illness perception variance and determines -46% of it; meaning the decrease Perceived Social Support from friends, the more the patient applies negatives the perception. Altogether, results indicate that Social Support have significant impact on Illness perception in patients with inflammatory bowel disease.

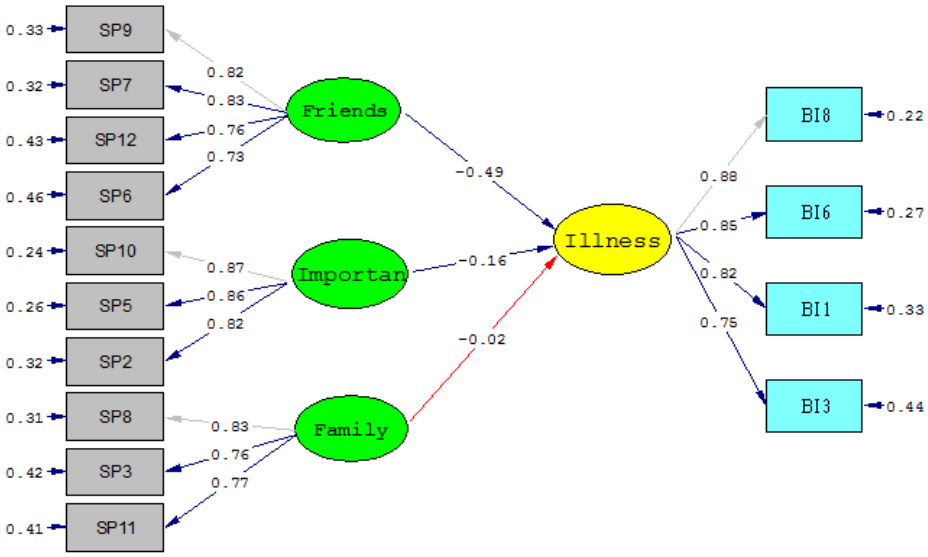

Figure 4: Sectional structural relationship between Perceived Social Support and illness perception (the red line means related path is not significant)

Table 3: Model's Indexes of Goodness of Fit

SRMR	RMSEA	AGFI	GFI	IFI	NFI	CFI	Chi/df	Df	χ^2	P
0/04	0/06	0/90	0/93	0/97	0/95	0/97	1/95	71	139	0.0000

4) Perceived Social Support can directly predict depression in patients with inflammatory bowel disease.

The model holds an acceptable goodness of fit, but the path from family domain of Perceived Social Support to Illness perception is not significant (T = -1.07). As the coefficient correlations are indicated on the paths, significant other Perceived Social Support has a Negative correlation with depression variance and determines -54% of it. Other than that the direction of correlation is Negative; meaning the decrease Perceived Social Support, the more intensifying the depression.

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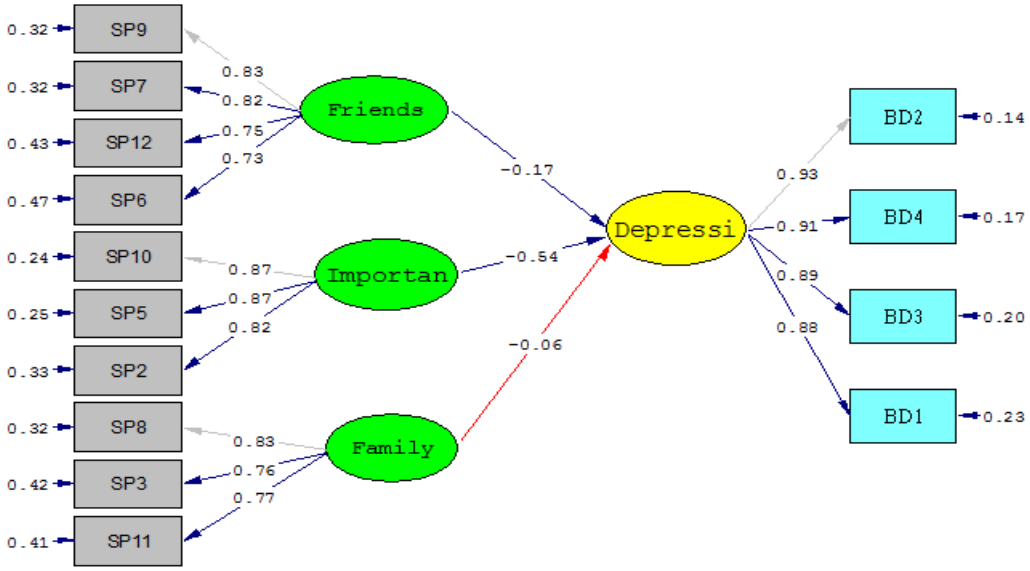

Figure 4: Sectional structural relationship between Perceived Social Support and depression (the red line means related path is not significant

Table 4: Model's Indexes of Goodness of Fit

SRMR	RMSEA	AGFI	GFI	IFI	NFI	CFI	Chi/df	Df	χ^2	P
0/04	0/07	0/87	0/91	0/96	0/95	0/96	2/5	71	182	0.000

5) In examining the whole model, it was concluded that a significant other and friends domains of Perceived Social Support can through Illness ***perception and coping strategies, predict depression in patients with inflammatory bowel disease.***

This model proved to have a very acceptable goodness of fit. **that a** significant other and friends domains of Perceived Social Support can through Illness perception and coping strategies, predict depression in patients with inflammatory bowel disease. But are not able to directly determine of depression variance and is not significant.

directly determine of depression variance, predict 49% of it through emotion-focused strategies and -50% of it by problem-focused strategies. estimation of indirect impact of significant other of Perceived Social Support equals 48% and illness perception, equals 12%. As a matter of fact, more significant other and friend of Perceived Social Support is resulted by utilizing more negative disease perception and much of emotion-focused strategy and less usage of problem-focused strategies, which leads to intensifying depression.

Overall, the results suggest that in the baseline, Perceived Social Support can strongly predict depression; and it›s partial impact on depression after IBD in patients, is imposed through illness perception and coping strategies specifically Perceived Social Support from friends .

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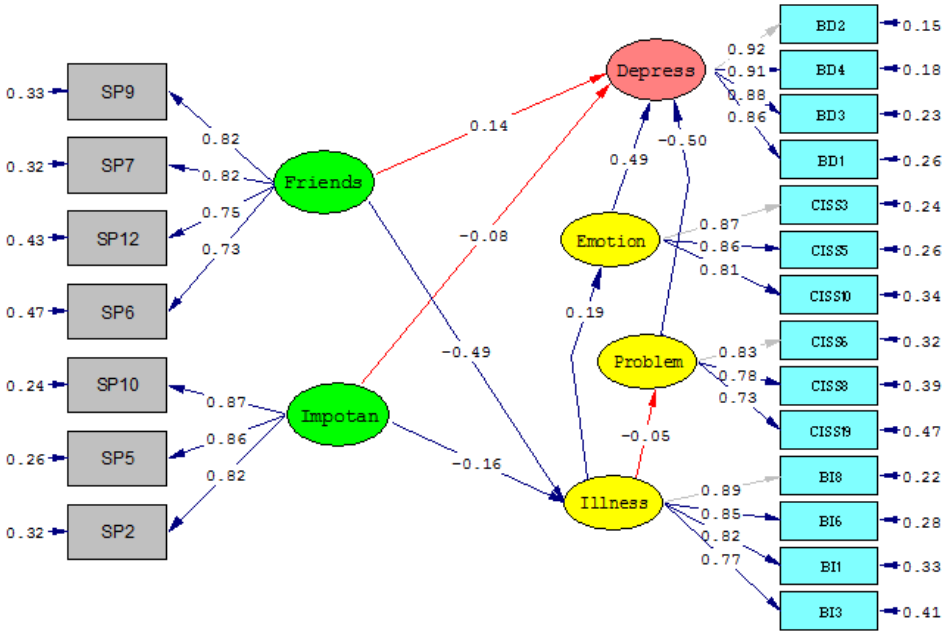

Figure 5: Examining the whole model

Table 5: Model's Indexes of Goodness of Fit

SRMR	RMSEA	AGFI	GFI	IFI	NFI	CFI	Chi/df	Df	χ^2	P
0.07	0.03	0.83	0.87	0.99	0.96	0.99	1.32	180	231	**0.0054**

VI. DISCUSSION AND CONCLUSION:

As shown in the present study, among the components of the Perceived Social Support Questionnaire (family, friends, important persons in life), perceived social support by the family neither directly nor indirectly (through mediators of illness perception and stress coping strategies) was not significantly associated with depression after diagnosis of inflammatory bowel disease; however, the social support, perceived by the friends and important persons had a significant direct relationship with depression after diagnosis of inflammatory bowel disease. There was a significant relationship between perceived social support by friends and important persons in life with depression after diagnosis of inflammatory bowel disease indirectly through the presence of mediating factors such as illness perception and emotional coping strategies.

Consistent with the present study, in a study, conducted in 2019 by Oliviera et al in Brazil(15), the results showed that because of the chronicity of IBD and because it has serious physical, social and emotional consequences, lower quality of life is predictable in these patients. They pointed out to a study, conducted by Roberston et al. (1989)(27), in which 80 patients were studied for IBD, and indicated that a large proportion of these patients reported that they could not talk with their friends , relatives and even their doctor about their fears and concerns of the disease. They concluded that the opportunity to discuss personal problems in a different (non-

familial) environment seems to be useful, and that attention to psychological problems may amend the prognosis for patients with IBD in long-term. Roberston and et al (1989)(27) also reported the increasing importance of identifying the psychosocial aspects of IBD and suggested that approaching these problems with integrated treatment protocols could potentially lead to improved quality of life. In a study by Maida et al. (2001)(16), there were significant associations between the interaction of these patients and their perception, and the level of IBD patients' stress and their satisfaction with social support. They concluded that social support may strongly influence the concerns of patients with IBD. On the other hand, some results of the present study are consistent with the study of Maunder and Esplen (2001)(17), in which no improvement in quality of life and depression was observed in a group of patients with IBD who received weekly 20-minute sessions on social and psychological support for 20 consecutive weeks. There is no theoretical consensus on how to provide social support, and whether social support affects quality of life and reduces the suffering of patients with IBD or not. Whether the disease itself is a risky issue and acts as an obstacle between the individuals and the network around them is an ambiguous question.Also in line with the present study, in the study of Shepanski et al (2004)(28) on improving the quality of life of patients with IBD, they suggested that increased social functioning is associated with better acceptance of IBD signs and less worry.

IBD usually imposes negative effects on various aspects of quality of life. IBD treatment focuses on improving the signs and clinical conditions. Meanwhile, in assessments such as endoscopy and medicational treatments, frequent and constant complications of such a disease are not considered. The concept of quality of life in IBD patients include a more comprehensive assessment of the effects of the disease, including social, family and professional outcomes. Social support is one of the aspects of quality of life that IBD patients need to address. Social support has been used as adjunctive therapy in several chronic diseases such as rheumatoid arthritis, cancer, AIDS, and alcoholism. More social support is usually recommended for a satisfying effect on chronic diseases. Social support was also used in IBD, but yielded controversial results.

According to recent studies in Iran, the prevalence of UC in the country is not as high as in the developed countries. In addition, the severity of signs in Iranian patients is less than in developed countries. There have been some signs of an increase in the prevalence of this disease in Iran in none official reports. A group of Canadian researchers studied the relationship between inflammatory bowel disease and quality of life in 388 patients in 2006. These people had developed the disease since 1999. The study showed that 74% of people with Crohn's disease and 66% of people with active ulcerative colitis within the first 6 months of diagnosis had higher levels of anxiety and depression, and lower levels of social support and quality of life, compared to those with passive disease (25). The amount of social support affects the coping styles of the patients and the level of depression in them (29). It has also been shown that although self-blame, fleeing, and avoiding stressful situations in life may have a short-term stressful effect, they have detrimental effects on mid-term and long-term stress. Bulk of research shows that a change in coping strategies and appropriate financial support may have an impact on the severity of psychological symptoms including depression. Coping strategies that are a strong predictor of depression after diagnosis include self-blame and high sensitivity, which are among inefficient coping strategies (29).

The direct relationship between perceived social support and depression in patients with IBD is not significant, but the indirect relationship (through illness perception and coping strategies) between perceived social support and depression in patients with IBD is significant. It is discussed that in line with the study of David et al.

(2000)(30), patients' perceived social support affects their coping strategies, and friends and important persons in life can lower the depression after IBD because of their effects on illness perception as well as coping strategies (mediators). Also in the present study, like in the studies of Maunder and Esplen (2001)(17) and Olivier (2007)(15), the study population had cultural-social differences, and they noted in their study that such differences among the population under study may account for some of the differences in the effectiveness of social support and even its inefficiency. For example, in their study, it was assumed that because of the subjects' low level of education, and therefore, less understanding of coping strategies and illnesses, and inefficient coping strategies, these patients' problems could even spread to other family members and other social networks, and these patients' perceived social support from their family might not play an efficient role in their level of anxiety.

The results of the Olivier's study (2007)(15) also showed that some of the aspects that make the patients feel less stressful and develop less depression at the beginning of the IBD diagnosis among these patients over the long term include clarification of the rights of people with chronic diseases and their social security and respecting the demands and conditions of the IBD patients working in departments and providing them with appropriate financial support for their medication. It means that when the individuals are more confident of the financial and social support at work and in health system, they are less likely to develop depression.

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