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# The Effect of Metacognitive Therapy on Treatment Adherence and Life Expectancy of Patients with Gastrointestinal Cancers

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**Abstract**
**Background:** Cancer as a chronic and severe disease, causes a lot of psychological distress in patients. One of the psychological interventions to control distress is metacognitive therapy. The aim of this study was to evaluate this type of treatment on life expectancy and consequently adherence to the treatment of the patients.
**Methods:** This study was a quasi-experimental two-group study. A total of 70 patients with gestational cancer were selected by convenience sampling and randomly divided into the intervention (n = 35) and control (n = 35) groups. The intervention group received 5 sessions (45-60 min) of metacognitive therapy, but the control group received the routine intervention. Data were collected using three questionnaires including: demographic and disease data questionnaire, Madanloo Treatment Adherence Questionnaire and Snyder's Hope Scale.
**Results:** Metacognitive therapy made significant changes in life expectancy and adherence to treatment in the intervention group compared to the control group (P < 0.0001). The results of an adjusted analysis of covariance to compare the scores of treatment adherence and life expectancy after the intervention in the intervention group were 15.55 and 19.6 higher on average, respectively.
**Conclusion:** The study indicates that metacognitive therapy has been effective in improving life expectancy and adherence to treatment of patients with gastrointestinal cancer. This intervention can be considered as an effective psychological intervention for these patients. Therefore, it is suggested that this intervention be established and promoted in counseling and psychotherapy centers in hospitals and treatment centers to accelerate the recovery process of these patients.
**Keywords:** Treatment adherence, Life expectancy, Cognitive therapy, Cancer, Iran

## Introduction

One of the major problems facing human society is cancer, which has been the main cause of the annual deaths of 9.6 million persons in 2018. Globally, about 1 in 6 deaths are due to cancer (1). Cancer is the second leading cause of death after cardiovascular diseases (2). In general, about two-thirds of cancers occur in developing countries, where there is only 5% of cancer control tools (3).

Patients with cancer experience several side effects and psychological distress during chemotherapy, often leading to a reduction in their quality of life (4). Patients with cancer usually have symptoms such as pain and experience a range of physical and mental disorders. Among the psychosocial problems that patients with

cancer develop are reactions such as denial, anger, and guilt, which leads to depression, frustration, and even suicide commitment (5).

When the patient's treatment plan is more complex or requires active lifestyle changes, the percentage of non-adherence to treatment can increase up to 70%. Patient dissatisfaction can lead to non-compliance with treatment and increase medical costs (6). Psychosocial support and exercise during treatment can reduce undesired symptoms and increase patient adherence to the anti-cancer treatment plan (7). Also, adherence to the desired treatment in the form of medication use exactly according to the prescribed cases, at the exact time, by observing the recommended dose and duration,

affects the recurrence of the disease, the effectiveness of treatment, and therapeutic response (8). On the other hand, as the level of patients' disappointment increases, their score of adherence to treatment decreases (9).

Cancer crises cause disturbances in the balance and coordination of mind, body and soul, but the most common in this period for the patient is a sense of despair, disappointment and depression (10). Disappointment hurts people's psychological health and causes disorders in various psychological aspects (11). Increasing hope increases the level of self-care, quality of life and general health of these patients. The positive effect of increasing life expectancy on self-esteem, meaning of life and reducing depression can be mentioned (12). In diseases such as cancer, hope is an important factor in a person's efforts to cope with his disease and increase the continuity of his treatment (13). Hope plays a key role in the life of cancer patients and their families (14). The presence of behavioral strategies helps the patient to actively pursue the set goals, which in turn can be effective in increasing life expectancy (15).

The use of metacognitive therapy to control patients' anxiety and psychological problems is effective on increasing compliance (16). Metacognitive therapy is a psychological intervention based on the self-regulatory executive function that aims to change the undesirable metacognition and characteristics of the cognitive attention syndrome (17). Metacognitive therapy stops the persistent factors of dysfunctional strategies, frees the person's attention from repeated conflicts with past unpleasant events, empowers and helps the person to get rid of cognitive, emotional and behavioral deficient attention to be able to focus on other aspects of life (5). Instead of targeting negative automatic thoughts, metacognitive therapy studies mind rumination process, thus reducing the likelihood of entering periods of depression and increasing life expectancy in patients with sensitive and difficult conditions (18). It can even be said that stress, depression and mind rumination in patients increase the length of treatment of patients and reduce their chances of survival. Given that cancer, as a stressful event, triggers psychological reactions, metacognitive therapy helps patients to minimize the negative impacts of their disease (19).

Many studies have been conducted nationally and internationally on the metacognitive therapy of patients in various dimensions such as generalized anxiety disorder (20,21), depression (22), fear of cancer recurrence (23), and post-traumatic stress disorder (24). However, no study has been conducted on the effectiveness of metacognitive therapy on adherence to the treatment of patients with gastrointestinal cancer. Cancer medical treatments are a combination of chemotherapy, radiation therapy, hormone therapy and surgery. This combination therapy takes a lot of time and requires a high commitment to behavioral and lifestyle changes. These painful and unpleasant therapies significantly affect the patient's behavior, lifestyle and adherence to treatment and, as a result, life expectancy. In this case, in addition to the need for emotional and social support, due to having a lot of negative thoughts and losing life expectancy, these patients need more interventions from the treatment team to increase their motivation, to be able to take care of themselves and their health.

**Methods**

The present study was a quasi-experimental two-group study with pre-test and post-test that was conducted between September 2020 and March 2021 in hospitals affiliated to Shahid Beheshti University of Medical Sciences in Tehran. The study population composed of patients with gastrointestinal cancers referred to oncology wards and outpatient clinics of chemotherapy in three hospitals of Imam Hossein, Shohada Tajrish and Taleghani in Tehran, Iran. After obtaining permission from the Research Ethics Committee of Shahid Beheshti University of Medical Sciences, the researcher referred to the research sites and after introducing himself and obtaining informed consent, proceeded to the purposeful sampling of patients with gastrointestinal cancer (stages II, III) who met the inclusion criteria. All of these patients had been newly diagnosed (for a maximum of 6 months). Questionnaires were completed at the same time as the start of treatment. These patients were randomly assigned to the two intervention (n = 35) and control (n = 35) groups. For the intervention group, the metacognitive intervention was performed in 5 sessions of 45-60 min (2 sessions per week), with the coordination of patients and at their desired hours. The interventions and training sessions were conducted individually. The training sessions for hospitalized patients during the hospitalization period and patients referred for outpatient chemotherapy were arranged based on the patients' visit to the hospital, and even in some cases, considering the gifts and telephone follow-up, patients were encouraged to continue the sessions. The routine care was performed in the control group. The questionnaires for the two intervention and control groups were completed by the researcher in two rounds, once in the first meeting with patients and then, two weeks after the end of the intervention sessions, in person or by phone.

The content of the metacognitive therapy training package was designed according to the valid texts and the practical manual of metacognitive therapy written by Wells (25), as well as the approval of the panel of experts, in the form of 5 sessions and implemented as follows (Table 1).

The assignment was reviewed in each session and by completing the assignment, the patient was encouraged and his positive behavior was reinforced. In each session, the content and training were fully explained and the

**Table 1.** The content of the metacognitive therapy training

| Sessions | Content |
|---|---|
| 1 | Introduction, evaluation of symptoms of the disease, presentation of metacognitive therapy logic, emphasis on the importance of solving psychological problems by the researcher, obtaining information about patients' concerns by asking open-ended questions and encouraging the patient to express the disease process in his own language, and evaluating and identifying positive and negative metacognitive beliefs of patients |
| 2 | Analysis of advantages and disadvantages of positive and negative metacognitive beliefs, and familiarity of patients with the two strategies of worry and mind rumination as ineffective coping strategies. |
| 3 | Evaluation and identification of metacognitive control strategies, correction, and replacement of useful metacognitive control strategies, use of Detached Mindfulness technique for dealing with dysfunctional metacognitive thoughts and mindfulness strategies (people at this stage had a very good sense of expressing their problems and solving them, and due to desensitization, they tended to continue the sessions, so that patients with other diagnoses in the ward also wanted to receive training and study). |
| 4 | Attention Training Technique (ATT) as an effective coping strategy strengthened attention control |
| 5 | Summary of the content, review of the proposed solutions, identification of the existing barriers to using the methods, find the causes and eliminate them and finally the conclusion. |

patient shared his experiences of psychological problems related to each session. Then, the assignment was done according to each training session. The researcher's contact number was provided to the participants to ask their questions about the assignment during the intervention if necessary. At the end of the treatment sessions, gifts were presented to the patients of the intervention group as a memorial and for the patients of the control group and other patients interested in the ward, educational brochures with assignments were prepared and presented for negative metacognitive belief elimination, motivation and mindfulness.

For data collection, "background variables and demographic information" questionnaire were investigated including 10 items of age, gender, level of education, marital status, economic status, employment status, number of children, type of cancer, stage of the disease and duration of diagnosis.

### Treatment adherence questionnaire

This questionnaire includes 40 phrases in the fields of concern for treatment (9 phrases), willingness to participate in treatment (7 phrases), ability to adapt (7 phrases), integrating therapy with life (5 phrases), adherence to treatment (4 phrases), commitment to treatment (5 phrases) and plan for implementation of treatment (3 phrases) and is rated in the 6-point Likert scale from 0 (not important at all) to 5 (very important). Based on the obtained scores, patients' treatment adherence was classified as very good (score: 75% to 100%), good (score: 50% to 74%), moderate (score: 26% to 49%) and poor (score: 0% to 25%). The design and psychometrics of this scale was done in 2018 by Seyed Fatemi et al (26) and its reliability was reviewed again in the present study by the researcher and the Cronbach's alpha value was 0.94, which was acceptable.

### Snyder's Hope Scale

It is a 12-item scale with 8-point Likert ranges from 1 (strongly disagree) to 8 (strongly agree). Of these items, 4 items are for measuring factor thinking, 4 items for measuring strategic thinking, and 4 items are deviant expressions. The subscales of factor thinking include the four terms 2, 9, 10, and 12; Route subscales include four terms 1, 4, 7, and 8; And 4 expressions 3, 5, 6 and 11 are as deviant expressions. Scoring statements 1, 5, 7 and 11 were removed as deviation expressions to increase the accuracy of the test. Therefore, the range of scores was between 8 and 64; 8 was the lowest score and 64 was the highest score.

The validity of this tool was reported by Kermani et al (27). through a retest after 3 weeks of 0.85 and for the subscriber thinking subscale 0.81 and for the paths 0.74. Also, the internal consistency of this scale through Cronbach's alpha was 0.74 to 0.84 and its validity coefficient was reported by the retest method of 0.80. The reliability of this scale was re-evaluated by the researcher, and Cronbach's alpha was 0.91 and acceptable.

This scale measures two subscales of factor and strategy. The subscale thinking includes four phrases of 2, 9, 10, and 12; the subscale route includes four phrases of 1, 4, 7 and 8; and 4 phrases of 3, 5, 6 and 11 are deviant. The phrases of 1, 5, 7 and 11 as deviant phrases were not scored to increase the accuracy of the test. The reliability of the tool was measured by the researcher. We have ICC = 0.96. Cronbach's alpha of Treatment Adherence Questionnaire is 0.94 and 0.91 for Snyder's Hope Scale. All values are more than 0.7 and acceptable.

In this study, data analyses were done through SPSS software version 20 and using independent t-test, Mann-Whitney, Chi-square, analysis of variance and analysis of covariance.

### Results

A total of 70 patients with gastrointestinal cancers participated in the present study. All samples completed the study. The sampling of this study was done during 4-months. The mean age of participants was $49.5 \pm 10.86$ years in the intervention group and $50.8 \pm 8.90$ years in the control group. Other demographic and clinical characteristics of the two study groups have been summarized in Table 2. In terms of education, in both

groups, subjects with high school diploma had the highest frequency (n = 26, 37.7%). Also, in both groups, moderate income was the most frequent reported income by the participants (n = 36, 52.2%). In the control group, 30 patients (88%), and in the intervention group, 28 patients (80%) were married. In both intervention and control groups, employed participants attained the highest frequency (n = 43, 62.3 %) and having 1-3 children was seen in the majority of patients in the intervention group and the control group (n = 35, 50.7%). The patients with the diagnosis duration of less than three months showed the highest frequency in both the intervention and control groups (n = 35, 50.7%). Mann Whitney test showed no statistically significant difference (P = 0.993) between the intervention and control groups in terms of detection time and the two groups were homogeneous in this respect.

Most patients with gastrointestinal cancer in both intervention and control groups were at stage II of the disease (n = 52, 75.4%) and according to chi-square test, there was no significant difference in the stage of the disease between the intervention and control groups (P = 0.588).

In terms of cancer type, the highest percentage of patients in the two groups was related to those with colon cancer (n = 26, 37.7%) and according to chi-square test, there was no statistically significant difference (P = 0.536) between the intervention and control groups in terms of cancer type and the two groups were homogeneous in this respect.

The results of independent t-test and covariance analysis test showed that the mean scores of treatment adherence (P = 0.004) and life expectancy (P = 0.016) in the

intervention group after intervention were significantly higher than before intervention compared to the control group (P < 0.001).

As can be seen in Table 3, mean scores of treatment adherence in the post-intervention stage, compared to before the intervention, show an increase in the intervention group compared to the same values in the control group. The mean score of treatment adherence increased from 121.80 to 166.00. Therefore, based on the results in the table, it can be found that metacognitive therapy has increased adherence to treatment in patients with gastrointestinal cancer. On the other hand, the results of independent t test showed that the mean score before the intervention was significantly higher in the intervention group, so covariance analysis was used to compare scores after the intervention and the results showed that the mean score after the intervention was higher in the intervention group.

Figure 1 shows that the scores of treatment adherence in the intervention group, after the intervention increased significantly by about 15.55, while no change was observed in the control group.

As Table 4 shows, the mean life expectancy scores of the intervention group in the post-intervention stage increased compared to the pre-intervention stage. The mean life expectancy scores increased from 67.94 to 84.42. Therefore, based on the results in the table, it can be found that metacognitive therapy has increased life expectancy in patients with gastrointestinal cancer. On the other hand, the results of independent t test showed that the mean scores before the intervention were significantly higher in the intervention group, so to compare the scores after the intervention, analysis of

**Table 2.** Frequency distribution of study groups according to the demographic and disease information

| Variable | | Group | | Total | P value |
| | | Intervention | Control | | |
| | | No. (%) | No. (%) | No. (%) | |
|---|---|---|---|---|---|
| Type of cancer | Colon cancer | 16 (45.7) | 10 (4.29) | 26 (7.37) | 0.536[a] |
| Disease stage | Stage II | 27 (77.1) | 25 (5.73) | 35 (7.50) | 0.588[a] |
| Duration of diagnosis | Less than 3 months | 18 (51.4) | 17 (0.50) | 43 (3.62) | 0.993[b] |
| Employment status | Employed | 18 (51.4) | 25 (5.73) | 58 (1.84) | 0.26[a] |
| Marital status | Married | 28 (80.0) | 30 (2.88) | 36 (2.52) | 0.35[a] |
| Income | Medium | 36 (52.2) | 19 (9.55) | 36 (4.30) | 0.12[b] |
| Education rate | Diploma | 11 (31.4) | 10 (29.4) | 26 (7.37) | 0.322[b] |

[a] Chi-square; [b] Mann-Whitney.

**Table 3.** Comparison of treatment adherence scores before and after the intervention in the two groups

| Adherence to treatment | Group | | P value |
| | Intervention group Mean (SD) | Control group Mean (SD) | |
|---|---|---|---|
| Before intervention | 121.80 (27.94) | 104.62 (6.81) | 0.004[a] |
| After intervention | 166.00 (10.42) | 101.53 (22.19) | 0.001[b] |

[a] Independent t test; [b] Covariance analysis test.

covariance was used and the results showed that the mean score after the intervention stage was higher.

Figure 2 shows that life expectancy score in the intervention group, after the intervention had a significant increase by about 19.6, while no change was observed in the control group.

## Discussion

In statistical comparison of the intervention and control groups in terms of treatment adherence, the null hypothesis was rejected and metacognitive therapy was found to have a positive effect on adherence to treatment in the intervention group. Similarly, in a study by Asaszadeh and Mahmoudalilou on patients with breast cancer, metacognitive therapy and follow-up reduced mind rumination and caused more adherence of their patients to treatment (18). Winter et al in a study found that those suffering from depression showed more adherence to treatment after metacognitive sessions (28). Also, in a study by Miegel et al, which was related to patients with obsessive-compulsive disorder (OCD), 80 patients were studied for three months. After metacognitive therapy, significant effects were observed in the intervention group with OCD (29). In this intervention the patients are encouraged to go through the treatment process with patience and motivation, as well as adhere to living according to their values and goals. With metacognitive therapy, the patient chooses to be healthy as a value and given that one of the behavioral

values is treatment adherence, they follow the treatment recommendations and receive positive reinforcement for this healthy behavior. So that this reinforcement may be internal (such as feeling healthy) or external (such as feeling approved after praise) and then the patient is more likely to repeat the behavior, therefore, adherence to treatment should be increased (30).

For the variable of life expectancy, the results of the analysis of covariance showed higher life expectancy score after the intervention in the intervention group, so that the null hypothesis was rejected. Therefore, the positive effect of metacognitive therapy on life expectancy in patients with gastrointestinal cancer can be concluded. Consistent with the present study, in a study by Wells et al on metacognitive therapy for those who resisted the treatment of depression, more than 60% of the subjects during 12 months showed a significant positive effect on life expectancy and process of recovery (31). Lakshmi et al in their study showed that metacognitive therapy provides the opportunity to discontinue maladaptive and harmful ways of thinking, eliminate the patient's negative beliefs and focus on the natural symptoms of arousal so they efficiently and at the same time different from other cognitive methods face wrong beliefs about their problems and as a result their life expectancy is increased (32). Also, according to a study by Kavosi et al on the effects of metacognitive therapy, positive metacognitive beliefs indirectly reduce dysfunctional mental methods and increase life expectancy and quality of life in all
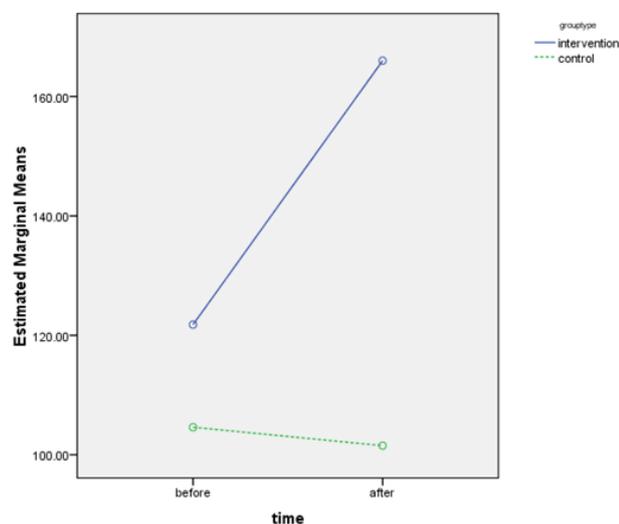


**Figure 1.** Comparison of treatment adherence scores after the intervention in the intervention and control groups
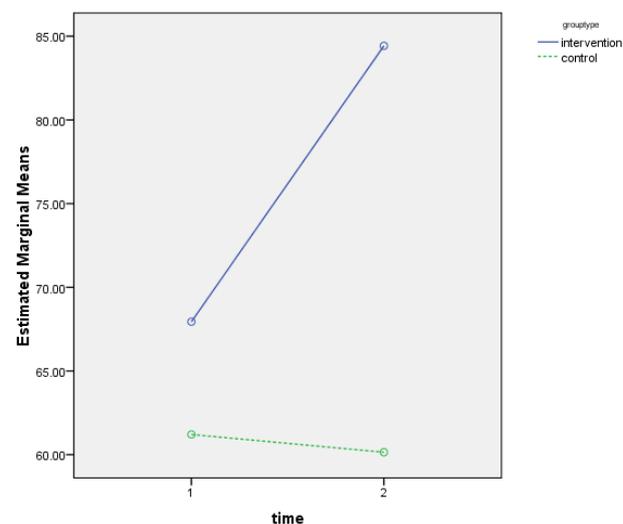


**Figure 2.** Comparison of life expectancy scores after the intervention in the intervention and control groups

**Table 4.** Comparison of life expectancy scores before and after the intervention in the two groups

| Life expectancy | Group | | P value |
|---|---|---|---|
| | Intervention group Mean (SD) | Control group Mean (SD) | |
| Before intervention | 67.94 (13.23) | 61.20 (8.92) | 0.016[a] |
| After intervention | 84.42 (8.26) | 60.14 (9.72) | 0.001[b] |

[a] Independent t test; [b] Covariance analysis test.

aspects. This study also showed a negative and significant relationship between metacognitive beliefs and quality of life in those with cancer, but no significant relationship has been found for those who did not have cancer (5). Kahrazei et al, too, in their study found that metacognitive therapy can have a great effect on a patient's quality of life, and this positive effect increases life expectancy and hope for the future and planning for it, and finally leads to more companionship in the treatment process. Prevention of emotional disorders in cancer patients is also necessary because these patients are at risk of mental and emotional damages (19). This intervention in other patients also causes them to continue treatment with optimism and self-confidence despite stressful and chaotic conditions (33). Another study on cancer patients found that metacognitive intervention and counseling sessions for these patients had positive and promising results in improving the mental health of patients, including symptoms of depression, stress, and anxiety (34). A study by Moghadamfar et al, which is consistent with the present study, has shown the positive effects of metacognitive therapy on increasing life expectancy. The mentioned study was conducted on patients with breast cancer in which patients were encouraged to recognize the values and set goals while trying to achieve these goals, prevent negative thoughts such as anxiety, stress, disappointment and depression, each of which in turn, make a person's mood worse. Also, this metacognitive approach gives patients a different view of mental events, which causes having a different view of their mental process and approaches and consider it as a part of himself (35). A study by Khait and Lazenby found that metacognitive therapy effected mind rumination (such as reviewing one's past bad events several times and over-analyzing these memories) which could be a prognosis for depression. Besides, due to metacognitive awareness sessions for those with cancer, the self-esteem of these patients also increases (34). This increase in mindfulness can also be a mediator between perceived stress and negative emotions for the patient. Therefore, it increases hope in these patients to continue treatment in the face of stressful and turbulent conditions with optimism, assertiveness and self-confidence (36). In an article by Lopez-Moringo et al on metacognitive therapy in patients with schizophrenia, consistent with the present study, the results confirmed the positive effect of metacognitive therapy on these patients (37). It can be said that given the ability to control and regulate emotions during metacognitive intervention sessions, this type of intervention through increasing the patient's awareness of their moods and emotions, reduces resistance and acceptance of negative thoughts and finally leads to compliance with mental conflicts and consequently increases hope. All these changes were achieved in a short time, and for long-term changes, treatment sessions can

be extended. The present study was conducted using metacognitive therapy for the first time on treatment adherence of patients with gastrointestinal cancer. It is suggested to consider the following in future studies: Assessment of the effect of this intervention on the resilience of the family of these patients, implementation of this intervention in other chronic diseases, and investigating the effect of mental imagery and mind-body technique as a therapeutic style along with metacognitive therapy for chronic patients.

## Conclusion

The study results indicate that metacognitive therapy has been effective in life expectancy and treatment adherence of patients with gastrointestinal cancer. Metacognitive therapy can be used as a beneficial intervention for patients with gastrointestinal cancer. Therefore, it is recommended to establish and promote counseling and psychotherapy centers in hospitals and treatment centers to improve the recovery process of these patients. Life expectancy allows a person to overcome stressful situations and make a constant effort to achieve his goal; those who have more hope will make more efforts for achieving their goals. Hope can be considered as a reason to get rid of the current unhealthy situation and suffering and thus increase adherence to treatment of patients.

## Conflict of Interests
None declared.

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