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Original Article

Comparing the effectiveness of emotion-based therapy and compassionate mind-based therapy on post-traumatic growth and perceived positive and negative emotions in adult inpatients who have recovered from Coronavirus

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Abstract

Introduction: This research aimed to compare the effectiveness of emotion-based and compassionate mind-based therapy on post-traumatic growth and perceived positive and negative emotions in adult inpatients who have recovered from Coronavirus.

Materials and Methods: The statistical population of this cross-sectional study included all recovered patients diagnosed with Coronavirus in Mashhad-Iran during July-September 2021. Forty-five patients were selected and divided into three equal groups randomly (two experimental groups and one control group). The experimental groups received emotion-based therapy or compassionate mind-based therapy. The research instruments were the Post-traumatic Growth Inventory and the Positive and Negative Affect Scale (PANAS). Data were analyzed through mixed variance analysis, repeated measurements, and SPSS-23 software.

Results: The results showed that there is no significant difference between the two interventions on post-traumatic growth and perceived positive and negative emotions in adult inpatients who have recovered from Corona; however, both therapies affect positive and negative emotions and post-traumatic growth in post-test and 3-month follow-up ($P< 0.05$).

Conclusion: Based on the results, emotion-based and compassionate mind-based therapy can improve post-traumatic growth and positive and negative emotions in adult inpatients who have recovered from Coronavirus.

Keywords: Compassion, Coronavirus, Emotion, Post-traumatic growth

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Introduction

The COVID-19 epidemic has caused despair and panic worldwide. This disease is frequently transmitted (1), and forced lifestyle changes during the corona epidemic can also be one of these experiences that cause psychological problems such as anxiety disorders, depression, isolation, and overall psychological distress. This causes psychological problems, especially in patients with a history of hospitalization (2).

Hospitalized people have different psychological conditions because the mortality

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rate in these patients is higher than that of non-hospitalized patients. It can be predicted that the conditions of these patients especially the threat to life causes worse psychological symptoms and makes them susceptible to post-traumatic stress disorder symptoms (3). However, the occurrence of an unfortunate accident can lead to positive and valuable psychological achievements such as achieving a philosophy of life, a broader sense of wisdom about the world, living in the present moment or increasing life satisfaction, which is defined as post-traumatic growth (4). It is a positive change experienced due to struggling with a major life crisis or a traumatic event (5). Post-traumatic growth has five aspects: 1- Social relationships and the development of social networks; 2- New facilities, routes, and opportunities; 3- Strengthening personal power; 4- Self-confidence; and 5- Change of inner spirituality and appreciation of life (6).

Among the other important psychological variables affected by the Corona epidemic is the perception of positive and negative emotions. Positive emotions include states such as hope, happiness, and positive experiences. They are identified as an important factor for well-being because they are associated with flexibility, life satisfaction, social rewards, mindfulness, and physical health (7). Negative emotions are a common aspect of inner disappointment and the inability to do what is pleasing to a person, which will lead to avoidant behavior such as fear, agitation, anger, guilt, and aggression and eventually lead to the loss of peace (8).

The increasing excessive monitoring, feeling of threat, and fear of the disease recurrence are characteristic of those who experience corona disease. Therefore, beyond physical health, people at risk and patients with coronavirus may fear consequences such as death or severe physical disability. Such emotional distress during the corona epidemic is associated with boredom, loneliness, anger, sadness, and sometimes severe depression, which can reduce positive emotions (9).

At the same time as the epidemic of corona disease, psychologists have used various treatment methods to improve the psychological condition of hospitalized patients who have recovered from Corona. Emotion-based therapy is a short-term therapy that focuses on the quality of people's relationships and their attachment styles. It is based on the principle that emotions are the key to identity and lack of emotional awareness or unconscious avoidance of unpleasant emotions (10). This treatment method uses the components of focusing on positive feelings, emotional reconstruction, and finding new meanings for a better relationship with other people, which leads to greater psychological well-being (11).

In the conditions of the Corona epidemic, fear (I am afraid of being infected/unintentionally infecting others and death may follow) has become one of the daily thoughts of people, which affects one's decisions, actions, and emotions. The era of the Corona epidemic has brought with it feelings such as helplessness, loneliness, anger, shame, and in other words, all negative emotional reactions for humans, and treatment based on emotions can be very effective on these negative emotions (12).

In addition, compassionate mind-based therapy is appropriate in traumatic conditions. Compassionate mind-based therapy by Gilbert (13) shows the skills and characteristics of compassion and helps to change cognitive and emotional patterns related to anxiety, self-criticism, anger, and shame (14). This treatment method was proposed for people with high negative emotions who think their problems are chronic or unacceptable (15). The purpose of this treatment is to facilitate emotional change for more self-care and self-support (16).

Regarding the lack of comparative studies about these two treatments in the field of post-traumatic growth and perceived emotions, this research seeks to compare emotion-based therapy and compassionate mind-based therapy on post-traumatic growth and perceived positive and negative emotions in hospitalized patients with a diagnosis of Corona.

Materials and Methods

The statistical population of this cross-sectional study included all recovered patients diagnosed with Coronavirus in Mashhad-Iran during July-September 2021. The appropriate sample size for forming group meetings is between 6 and 15 members (17). Forty-five patients were selected randomly and divided into three equal groups randomly (two experimental groups and one control group). The first experimental group received emotion-based therapy, the second experimental group received compassionate mind-based therapy, and the control group only responded to the questionnaires.

The inclusion criteria included aged 20-50 years, hospitalization only in special hospitals for patients with Corona, diagnosis of Corona disease, living in Mashhad city, 1-3 months have passed since the complete recovery from the disease, and willingness to participate. The exclusion criteria included having an underlying disease related to Corona and its complications, having a diagnosed psychiatric disease in the patient or first-degree family members, receiving psychotherapy during illness or after it, a history of substance or alcohol addiction in the patient or parents and spouse, and refuse to continue the research in any stages.

Also, the principles of ethical considerations were observed in this research. The researchers explained the process to the patients. The participants signed the written consent. The questionnaires were nameless, and the patients participated voluntarily.

Research instruments

A) The Post-traumatic Growth Inventory: This inventory was developed by Tedeschi and Calhoun (1996) to evaluate changes in the self-perception of people facing traumatic experiences and incidents. This inventory measures five components of new ways relating to others, personal strength, spiritual change, and the value of life. It contains 21 items on a Likert scale ranging from 0 (I do not consider this change to be the result of my crisis) to 5 (I consider this change to a great extent to be the result of the crisis). The internal consistency of the total scale was reported to be equal to 0.90, and for each of the components was equal to 0.85, 0.84, 0.67, 0.72, and 0.85, respectively. The two-month retest reliability for the total scale was also 0.71 (18). In Iran, Kazemipour, Mirderikvand, and Omaraei evaluated its reliability using Cronbach's alpha coefficient as 0.91 (19). Also, Hosseinlou and Namvar obtained Cronbach's alpha coefficient of 0.85 for this scale (20).

B) The Positive and Negative Affect Scale (PANAS): Watson et al. (1988) developed this scale. On this scale, ten questions are related to positive emotions, and ten are related to negative emotions. The complementary opinion about these emotions is evaluated on a 5-point scale (1 to 5). A higher score in each component indicates more experience. Watson et al. reported Cronbach's alpha at 0.90 for positive emotion and 0.87 for negative emotion (21). In Iran, Zaki, Rostami, and Kamasi evaluated the validity and reliability of this scale as equal to 0.82 (22).

Emotion-based therapy was implemented based on Greenberg, Warwar, and Malcolm's (2008) treatment plan in a group and eight 45-minute sessions (23) (Table 1). Also, compassionate mind-based therapy was implemented based on Gilbert's (2010) treatment plan in eight 45-minute sessions (Table 2) (13). Data were analyzed through mixed variance analysis, repeated measurements, and SPSS-23 software.

Table 1. Content of the emotion-based therapy

Session	Content
1	Knowing the members of the group, introducing the therapist, examining their motivation and expectation from participating in the group, providing a definition of the concepts of emotional therapy, and initial acquaintance with the problems of the members
2	The therapist encourages the group members to express their fears, such as fear of death, rejection, or fear of telling a flaw that hinders the dynamics of their relationships.
3	The secondary reaction emotions such as anger, failure, bitterness, emotions related to the disease are reflected and valued.
4	The group members, with the help of the therapist, externalize the problem and look at the primary feelings and unfulfilled attachment needs as a key communication problem.
5	The group members get to know their different aspects and finally experience their sense of worth.
6	The group members learn to trust the newly revealed emotions and experience new reactions to their motivations.
7	The primary emotions that were identified in the previous stages are processed more fully. The therapist initiates a routine in which the client expresses his/her desire for a new type of communication in an almost explicit manner.
8	The group members help each other create new solutions for their problems and express a new aspect of their problems and try to redesign it. Also, they remember the route they used to take and how they found their way back.

Table 2. Content of the compassionate mind-based therapy

Session	Title	Content	Homework
1	Creating collaborative relationships	Having interaction and joint activity Having common ideals and goals Having our feelings Group dynamics	Rhythmic relaxation breathing exercise
2	Empathy training	Presenting a non-judgmental attitude Helping members Reacting to any rejection Helping each other	Answer the questions; How compassionate are you with yourself?
3	What is self-compassion?	The formation and creation of more and more diverse feelings The theories that explain the psychopathology of disorders from the biological and nature aspects.	Identifying the thoughts and behavior of the self-critic
4	Teaching forgiveness	Teaching the concept of awareness Accepting mistakes and forgiving yourself Human contributions	Awareness practice in tracking thoughts and feelings
5	Introducing mental imagery and its logic	Imagery training and its implementation in the group 1- Problem-oriented orientation 2- Definition of the problem 3- Production of solutions 4- Evaluation of solutions 5- Implementation of the solution 6- Teaching social skills and courage	Practicing mental imaging of the meeting with a compassionate person and paying attention to its objective and partial features
6	Cultivating self-compassion	Wisdom education Ability Warmth and responsibility in creating compassion	Mental imagery of the self-compassionate
7	Focusing on self-compassion and identifying its different dimensions	Practicing writing a compassionate letter to yourself Practicing self-compassion and procrastination Compassionate body scanning in group	Self-compassionate mental imagery
8	Recalling the skills of compassion	Explaining the role of compassion in guiding the way of thinking and reactions, training the thoughts and behavior of a compassionate person in front of a critic Review of past sessions	Daily recording of compassionate mind (self-critical thoughts/ compassionate thoughts/ compassionate behavior)

Results

The descriptive statistics of perceived positive and negative emotions and post-traumatic growth by pre-test and post-test of the control and experimental groups were presented in Table 3.

Table 3. The descriptive statistics of perceived positive and negative emotions and post-traumatic growth

Variable	Stage	Control (M ± SD)	Emotion-based therapy (M ± SD)	Compassionate mind-based therapy (M ± SD)
Post-traumatic growth	Pre-test	78.07 ± 15.57	80.87 ± 14.06	78.07 ± 16.61
	Post-test	78.33 ± 12.81	96.60 ± 13.16	93.13 ± 15.12
	Follow-up	78.87 ± 14.67	90.07 ± 13.83	90.07 ± 16.10
Positive emotions	Pre-test	20.67 ± 4.29	20.00 ± 4.07	19.07 ± 5.71
	Post-test	20.87 ± 5.85	27.87 ± 4.22	25.00 ± 5.96
	Follow-up	21.47 ± 5.89	23.87 ± 5.94	23.33 ± 7.02
Negative emotions	Pre-test	20.47 ± 5.01	21.20 ± 7.01	23.93 ± 6.17
	Post-test	20.67 ± 6.86	16.13 ± 5.34	18.07 ± 4.13
	Follow-up	20.27 ± 6.55	14.13 ± 4.03	18.13 ± 2.36

Based on the above table, the mean scores of post-traumatic growth and perceived positive emotions increased in the experimental groups in the post-test stage compared to the pre-test,

and this change remained until the 3-month follow-up. While the mean score of the perceived negative emotions in the experimental groups decreased in the post-test and follow-up. To perform the mixed analysis of variance test with repeated measurements, the assumptions of this test were first checked and confirmed. Based on this, the normality of the data distribution using the Kolmogorov-Smirnov test indicated no significant difference in the pre-test of the two groups using one-way variance analysis. Also, checking the linearity of the relationship between the variables using a scatter diagram, the assumption of homogeneity of covariance matrix was made and confirmed using the M-box test and homogeneity of variances using Levene's test. Because the current research design was a pre-test, post-test, and follow-up of three groups, a mixed variance analysis test with repeated measurement was used (Table 4). The results of the mixed analysis of variance with repeated measurements for each of the variables are listed below.

Table 4. Results of repeated measurement variance analysis for post-traumatic growth and perceived positive and negative emotions

Effect		Test	Amount	F	df assumption	df error	P	η2
Intergroup		Pillai	*0.290	2.318	6.000	82.000	0.041	0.145
		Wilks Lambda	*0.722	2.360	6.000	80.000	0.038	0.150
		Hoteling	*0.369	2.398	6.000	78.000	0.035	0.156
		Roy's greatest root	*0.317	4.334	6.000	41.000	0.010	0.241
Intragroup	Time	Pillai	**0.800	24.687	3.000	37.000	0.000	0.800
		Wilks Lambda	**0.200	24.687	6.000	37.000	0.000	0.800
		Hoteling	**4.003	24.687	6.000	37.000	0.000	0.800
		Roy's greatest root	**4.003	24.687	6.000	76.000	0.000	0.800
	Time * Group	Pillai	**0.774	3.999	6.000	74.000	0.000	0.387
		Wilks Lambda	**0.303	5.041	6.000	74.000	0.000	0.450
		Hoteling	**2.049	6.148	12.000	72.000	0.000	0.506
		Roy's greatest root	**1.917	12.141	12.000	38.000	0.000	0.657

**Significance level 0.99 *Significance level 0.95

The results showed that the main effect of measurement time is significant. That is, there is a significant difference between at least one of the components of post-traumatic growth and perceived positive and negative emotions in the pre-test, post-test, and follow-up regardless of the group factor ($P< 0.01$, $\eta2= 0.8$, $F(6,37)= 24.687$, $\Lambda= 0.2$). Also, the results showed that the main effect of the group is also significant. That is, there is a significant difference between at least one of the components of post-traumatic growth and perceived positive and negative emotions in the three groups, regardless of the measurement time factor ($P< 0.05$, $\eta2=0.15$, $F(8,80)= 2.360$, $\Lambda= 0.722$). Also, the results of the interaction of time in the group indicated that the trend of changes in scores of at least one of the components of post-traumatic growth and perceived positive and negative emotions from pre-test to post-test and follow-up in three groups ($P< 0.01$, $\eta2= 0.45$, $F(12,72)= 5.041$, $\Lambda= 0.303$). Mauchly's test of Sphericity was used to check the uniformity of the conditions of these subjects. This test assesses the assumption that the error covariance matrix related to the normal transformed dependent variables is the same. The findings of this test for the components of negative emotions and post-traumatic growth were significant ($w< 0.05$), and this means that the assumption of sphericity is not established for this variable and, therefore, the adjusted degrees of freedom of Greenhouse-Geisser was the basis for reporting the F value. In addition, in the case of significant intra-group and inter-group differences due to rejection of the assumption of sphericity, the Bonferroni post hoc test is used (24). To investigate the intra-group effects, i.e., the measurement time, and the interaction of the measurement time with the inter-group effect, i.e., the studied groups, the results of Table 5 are presented on post-traumatic growth and perceived positive and negative emotions.

Table 5. Results of variance analysis of repeated measurement of post-traumatic growth and perceived positive and negative emotions with Greenhouse correction

Source	Variable source	Statistics	SS	df	MS	F	P	Eta
Time effect	Positive emotions	Sphericity	502.459	2	251.230	32.95	0.000	0.440
	Negative emotions	Greenhouse-Geisser	485.644	1.628	298.389	13.11	0.000	0.238
	Post-traumatic growth	Greenhouse-Geisser	2552.237	1.723	1480.980	42.63	0.000	0.504
Time * Group effect	Positive emotions	Sphericity	247.852	4	61.963	8.12	0.000	0.279
	Negative emotions	Greenhouse-Geisser	253.911	3.255	78.004	3.42	0.019	0.140
	Post-traumatic growth	Greenhouse-Geisser	1229.096	3.447	356.602	10.26	0.000	0.328

The results of the mixed variance analysis test of sphericity statistics for positive emotions variable ($P< 0.01$, $\eta2= 0.44$, $F(2)= 32.95$) and based on Greenhouse correction for negative emotions variables ($P< 0.01$, $\eta2= 0.23$, $F(1.6)= 13.111$) and post-traumatic growth ($P< 0.01$, $\eta2= 0.50$, $F(1,7)= 42.639$) showed that in all three components, the time factor had a significant effect on each of these variables, which shows that the scores of post-traumatic growth and perceived negative emotions had a significant difference in at least one of the pre-test, post-test, and follow-up stages. It is also about the interaction of the time factor in the results of the mixed analysis of variance test of the sphericity statistic for the variable of positive emotions ($P< 0.01$, $\eta2= 0.28$, $F(4)= 8.12$) and based on the Greenhouse correction, for negative emotions ($P< 0.05$, $\eta2= 0.14$, $F(3.2)= 3.427$) and post-traumatic growth ($P< 0.01$, $\eta2= 0.32$, $F(3,4)= 10.267$) showed that the time factor in the group had a significant effect on each of these variables.

To check the interaction of the measurement time and the inter-group variable on the variables of post-traumatic growth and negative emotions, Bonferroni's post hoc test was used (Table 6).

Table 6. The results of Bonferroni's post hoc test of the interaction between the intra-group factor and the inter-group factor to compare the variables of post-traumatic growth and perceived negative emotions

Group	Variable source	Time		Mean	SD	P	P level Low limit	P level High limit
Control	Positive emotions	1	2	-0.200	1.131	1.000	-3.273	2.873
			3	-0.800	1.105	1.000	-3.803	2.203
		2	3	-0.600	0.786	1.000	-2.735	1.535
	Negative emotions	1	2	-0.200	2.477	1.000	-6.932	6.532
			3	0.200	2.098	1.000	-5.502	5.902
		2	3	0.400	1.312	1.000	-3.166	3.966
	Post-traumatic growth	1	2	-0.267	2.728	1.000	-7.681	7.148
			3	-0.800	1.719	1.000	-5.471	3.871
		2	3	-0.533	1.762	1.000	-5.321	4.254
Emotion-based	Positive emotions	1	2	-7.867*	0.524	0.000	-9.292	-6.442
			3	-3.867*	1.125	0.012	-6.924	-0.809
		2	3	4.000*	1.104	0.008	0.999	7.001
	Negative emotions	1	2	5.067*	0.746	0.000	3.039	7.095
			3	7.067*	1.581	0.002	2.770	11.364
		2	3	2.000	1.125	0.292	-1.059	5.059
	Post-traumatic growth	1	2	-15.733*	2.666	0.000	-22.980	-8.487
			3	-9.200*	2.456	0.007	-15.874	-2.526
		2	3	6.533*	1.947	0.014	1.243	11.824
Compassionate	Positive emotions	1	2	5.933*	0.819	0.000	-8.160	-3.707
			3	-4.267*	1.201	0.010	-7.531	-1.002
		2	3	1.667	1.076	0.432	-1.259	4.592
	Negative emotions	1	2	5.867*	1.770	0.015	1.057	10.676
			3	5.800*	1.243	0.001	2.422	9.178
		2	3	-0.067	0.983	1.000	-2.738	2.605
	Post-traumatic growth	1	2	-15.067*	1.364	0.000	-18.775	-11.359
			3	-12.000*	1.528	0.000	-16.151	-7.849
		2	3	3.067	1.136	0.052	-0.020	6.154

The results showed no significant difference between the three measurement times for the control group. However, there is a significant difference between the pre-test and post-test and between the pre-test and the follow-up for the experimental groups in all variables. Therefore, both treatments were effective until the post-test stage, but this effect was stable until the follow-up stage. The results of Table 7 present the intergroup effect, i.e., the studied groups, on post-traumatic growth and perceived negative emotions.

Table 7. Intergroup effect test to compare post-traumatic growth and perceived negative emotions

Variable source		SS	df	MS	F	P	Eta
Positive emotions	Group	63.560	2	31.780	1.250	0.297	0.056
	Error	1067.393	42	25.414	-	-	-
Negative emotions	Group	97.437	2	48.719	2.763	0.075	0.116
	Error	740.563	42	17.632	-	-	-
Post-traumatic growth	Group	975.873	2	487.891	2.484	0.096	0.106
	Error	8249.956	42	196.428	-	-	-

The results of the intergroup effect test showed that the intergroup effect is not significant for the research variables. Therefore, there is no significant difference between the effectiveness of the two interventions on post-traumatic growth and perceived positive and negative emotions in hospitalized patients who have recovered from Corona.

Discussion

The results showed that both emotion-based therapy and compassionate mind-based therapy are effective on post-traumatic growth and perceived positive and negative emotions in hospitalized patients who have recovered from Corona, but there is no significant difference between the two treatments. There has been no research in this field. However, the effectiveness of emotion-based therapy on post-traumatic growth and perceived positive and negative emotions was reported in the research by Cucu-Ciuhan, Farhadinejad and Bostan, and Sadeghi et al. (25-27). The effectiveness of compassionate mind-based therapy on post-traumatic growth was concluded in studies conducted by Salimi et al., Borhani and Moradi, Hoffart, Oktedalen, and Langkaas (28-30). In addition, Aghaei Khajeh Langi et al., Adibizadeh and Sajjadian, Murris et al., and Lincoln, Hohenhaus, and Hartmann (31-34) found the effectiveness of mindfulness-based therapy on perceived positive and negative emotions. All these studies support our findings.

In this line, Zhou et al. assessed the relationship between emotion regulation and post-trauma stress disorder and post-traumatic growth in 315 adolescents who survived the Yaan earthquake in China. They found that traumatic exposure had a significant and positive effect on post-trauma stress disorder and post-traumatic growth. Cognitive reappraisal had a positive effect on post-trauma stress disorder and a negative effect on post-traumatic growth, while under a low level of social support, expressive suppression had a positive and significant effect on post-trauma stress disorder (35). These findings suggest a major role of emotions in post-traumatic growth.

In addition, Ebrahimi, Ahmadi, and Farokhi investigated the effect of emotion-based therapy on post-traumatic growth and psychological capital in 30 female patients with multiple sclerosis. They concluded that this intervention increased the scores of all subscales of psychological capital inventory but increased the scores of subscales of post-traumatic growth inventory except spiritual change subscale (36).

Also, Deleuil and Mussap assessed 3117 adults during the COVID-19 pandemic. Their findings revealed that emotional regulation strategies were relevant to post-traumatic growth related to COVID-19 (37). Emotion-based therapy tries to reduce the effects and negative consequences of emotions and unfortunate events, and the person recovers their emotions after experiencing trauma (38). In this way, people can better accept, regulate, understand, and express their feelings to others, even if they are unpleasant (39). Also, self-compassion can become the basis for the correct regulation and management of emotions. Therefore, a person will find new ways to deal with critical situations in their life (40). The self-compassion meditation is similar to mindfulness meditation. The basis

of self-compassion has a logical and realistic attitude toward oneself, avoiding cognitive distortions and inflexibility in behavior and thoughts, emotion management, and a set of positive personality traits. This treatment will help to develop self-care (41). A study conducted by Zadafshar et al. on 230 nurses of a Coronavirus patient care unit based on perceived social support with mediating role of self-compassion and cognitive emotion regulation indicated that perceived social support through self-compassion and cognitive emotion regulation positively impacts post-traumatic growth in nurses (42).

This result presents the effects of interventions based on emotions and self-compassion on post-traumatic growth after Corona epidemic. In addition, Ghazanfariyanpour and Chalabianloo investigated the effectiveness of self-compassion intervention on positive and negative affect on university students. They concluded that self-compassion training could increase and decrease negative affect (43). These findings are in line with our results, although the population of the mentioned study consisted of university students, not corona patients.

In this line, Gonzalez-Mendez and Diaz studied 211 Spanish Red Cross volunteers who experienced traumatic events during the SARS-CoV-2 pandemic. Based on the findings, the volunteers with higher scores of self-compassionate used unhealthy strategies lower than volunteers with low levels of self-compassionate. Also, volunteers with the highest level of post-traumatic growth had higher self-kindness and satisfied psychological needs (44). These results supported our findings and the role of self-compassion in post-traumatic growth and perceived emotions. The present study had limitations, such as limited participants to hospitals in one city, lack of assessing other chronic physical illnesses, which interfered with the results, and using self-report tools to evaluate the effectiveness of the interventions.

Conclusion

Based on the results, emotion-based and compassionate mind-based therapy can improve post-traumatic growth and positive and negative emotions in adult inpatients who have recovered from Coronavirus.

Acknowledgments

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