



Original Article

# Study of well-being changes during Mindfulness Based Cognitive Therapy (MBCT) in a non-clinical sample: A process of change study

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## Abstract

**Introduction:** The aim of this study was to determine the virtuous well-being changes during mindfulness based cognitive therapy (MBCT) in a non-clinical sample and also to investigate the process of changing the variables of decentralization and perception of pleasure.

**Materials and Methods:** In this study, forty female students living in the dormitory of Shahed University of Tehran in the academic year 2018-2019 were selected based on the convenient sampling method and were randomly assigned to four groups. The intervention protocol was eight ninety-minute sessions. All four groups were evaluated before intervention. While the first group fulfilled them after two weeks, the second group after four weeks, the third group after six weeks, and the fourth group after eight weeks fulfilled the Ryffs Scales of Psychological Well-being (RPWB), completed the perceptions of pleasure perceptions. Data analyzed through descriptive and inferential statistics, and SPSS-18 software.

**Results:** The beta coefficient of scores before the intervention and the second, fourth, sixth and eighth weeks showed an increasing process of well-being during the sessions. This process became significant in the eighth session ( $P=0.01$ ). The subscales of self-acceptance and decentralization from the fourth session had a significant upward trend ( $P=0.0001$ ,  $P=0.001$ , respectively). Autonomy and personal growth significantly in the sixth session ( $P=0.01$ ,  $P=0.03$ , respectively), purposeful life significantly in the eighth session ( $P=0.03$ ) and the variable perception of pleasure from the eighth session ( $P=0.03$ ).

**Conclusion:** The results indicated the effectiveness of mindfulness-based cognitive intervention to increase well-being.

**Keywords:** Decentralization, Pleasure perception, Mindfulness based cognitive therapy, Well-being

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## Introduction

In recent years, great strides have been made in recognizing and treating mental disorders. These efforts are reflected in the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases

(ICD) developed by the World Health Organization (1,2). At the same time, promising efforts have been made to intervene to prevent the occurrence of disorders. In recent decades, the focus of psychologists has shifted from the negative and pathological aspects of personality

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to the positive aspects and abilities of individuals (2). The future of clinical psychology lies in linking positive psychology to clinical research. One of the areas for the development of positive clinical psychology is the attention of clinical professionals to understanding the concept of well-being and inviting specialists to research in this field (3).

There are two main approaches to welfare: hedonism and virtue. In the hedonistic or happiness perspective, it is assumed that an ideal life means living with joy and happiness while avoiding depression and unhappiness. Research shows that humans are not entirely consistently happy (4,5). This view implies that ideal life means the flourishing of human capabilities. In this view, whatever is valuable to the individual and in line with realistic goals is important (6).

The study of mind, clinical intervention, and a theoretical framework are positive in clinical psychology (7). Contrary to many schools of psychotherapy, and of course in line with the goals and assumptions of positive psychology, reflection on the presence of mind does not accept the assumption of pathology or does not emphasize the change in treatment. As a result, it seems better to consider mindfulness training as a preventative strategy in line with positive psychological goals (8).

Furthermore, the presence of the mind reduces suffering and promotes individual and interpersonal growth (9). In Iran, studies have been conducted on the effectiveness of mindfulness-based interventions on increasing well-being in the clinical and non-clinical population (10-12). These studies were performed on people with epilepsy, MS, teachers, and HIV patients. The effect size of these studies was evaluated based on Cohen's table above ( $d = 1.54$ ) (13).

In general, about the effect of methodology based on the presence of mind on the quality of life, the results indicate the significant effect of this method in increasing the quality of life of people with cancer (14), diabetics (15).

Overseas meta-analysis articles (18-16) rated the effectiveness of mindfulness-based interventions on well-being above average ( $g = 0.55$ ) and reported the effectiveness of online interventions based on mindfulness therapies on low well-being ( $g = 0.23$ ). These interventions were performed on participants with the clinical profile. Eberth and Sedlmeier's (19) meta-analysis was performed on non-

clinical adult specimens, and moderate effect size was reported ( $r = 0.37$ ).

The first issue that the present study intends to address is welfare change (self-acceptance, positive relationships with others, autonomy, overcoming the environment, purposefulness in life, personal growth) during the mindfulness-based cognitive intervention to process examine welfare change during sessions accurately.

On the other hand, explaining the effects of treatment is more complicated and perhaps more important than confirming the effectiveness. One of the challenges of psychology and psychotherapy as science is identifying the mechanisms of influence. A review of studies (20,21) identifies several possible mechanisms for how mindfulness exercises work. These mechanisms include: gaining a decentralized view of inner experience, reducing harmful avoidance, interpreting environmental dependencies more accurately, improving emotional regulation, and reducing rumination processes.

Many of these studies have been performed on clinical groups, and many of these mechanisms relate to the effect of mindfulness on disease reduction. To fill this gap in how the presence of the mind increases well-being, Garland, Farb, Goldin, and Fredrickson (22) have proposed the theory of the presence of the mind-meaning.

In the theory of mind-presence presence, first, the practice of mind-presence meditation causes decentralization (decentering) and stress assessment. This metacognitive state of mind presence then takes the permanent cognitions out of the automatic state and expands the scope of attention - all background information is covered - new data is collected; In this way, the positive reappraisal of stressors occurs, then positive emotions are perceived (savoring) and virtuous well-being is created. This ascending process leads to a constructive re-engagement with stressful life events, desirable social or adaptive activities, and a sense of meaning in life. According to the conceptual model of mind-presence theory, the variables of decentering, positive reappraisal, savoring, and attention span play a role in increasing well-being.

Studying the process of change can show us the pattern of change. In addition, knowing the form of change can draw the researcher's attention to identifying the causally related

factors. For example, if the most significant change occurred at the beginning or end of treatment, the researcher may wonder what factors acted during these times that caused the rapid change (23).

Another issue that the present study intends to address is the study of the process of change of decentering and perception of pleasure based on the theory of mind presence - meaning Garland et al. (22) so that we can understand when the changes of these components begin.

The results of a study by Alsubaie et al. (24) aimed at reviewing studies on the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) and Mindfulness-Based Stress Reduction (MBSR) in patients with physical or psychological problems showed general changes in mindfulness are associated with better treatment outcomes. However, this evidence is greater in studies that aim to improve psychological problems than in studies that aim to improve physical problems with the help of mindfulness. The gap seen in these studies is that the mechanisms associated with the effectiveness of mindfulness-based therapies, including MBCT and MBSR, are unclear.

Recent psychological research on the presence of the mind has largely ignored how the presence of the mind affects the flow of positive emotions, and this regulatory process leads to well-being.

Research in the treatment process is a new topic that has attracted the interest of psychotherapeutic researchers. However, randomized controlled trials can only show us whether the treatment has changed compared to the lack of treatment and tell us nothing about why the intervention led to the change or how these changes occurred. We know treatment is responsible for the change, but we do not know why and how it works. There is much debate and theorizing about why psychotherapy changes people, but supporting evidence is scarce (25).

Therefore, as mentioned, on the one hand, according to previous studies on the effect of the presence of the mind in reducing the disease of people with mental disorders and research gap in the study of the effect of the presence of the mind meaning (presence of mind focused on welfare) on individuals non-clinical as one of the fields of positivist psychology and the other hand due to the vacuum, a study on the process of changing the process of decentralization and

perception of pleasure based on the theory of mind-presence, this study aims to examine the changes in moral welfare during the cognitive intervention.

### Materials and Methods

The research design is parallel and four groups with pre-test-post-test. On the other hand, since the present study also examines the process of change, it is also considered a type of "research in psychotherapy". The present study examined the process of changing research variables; decentralization, perception of pleasure, and well-being (self-acceptance, autonomy, personal growth, positive relationships with others, purposefulness, and mastery of the environment).

The statistical population of this study included all female undergraduate female students in Shahed University in the academic year of 1996. The sampling of the present study was done by convenience sampling. Cohen's table was used to select the number of samples. Cohen (1988) rated 0.1 as a small effect size, 0.25 as a medium effect and 0.4 as a large effect size. Considering  $k - 1 = 3$ ,  $F = 0.40$  and  $\alpha = 0.5$  and power of 0.70, the number of each group was 15 people. Considering the size of the above effect related to the meta-analysis of studies conducted in Iran, if the  $F$  value is considered according to Table 0.50, 10 people in each group will suffice (26). In order to comply with ethical considerations, in the stages of collecting, implementing, and analyzing research data, participants were assured that their information would be kept confidential and analyzed without mentioning their names (Code: 8-9, Code of Professional Ethics: Organization of Psychology and Counseling of the Islamic Republic of Iran, 1386). The principles of confidentiality were observed. Furthermore, maintaining the subjects' psychological health was prioritized, and the subjects' willingness or unwillingness to participate in the research was respected, and the study participants were allowed to end their research collaboration whenever they wished. The research design was approved by the University Ethics Committee (IR.Shahed. REC.1396.3). Therefore, the clinical trial code of this study is IRCT20120612010008N3.

### Research instrument

A) *Demographic Questionnaire*: In this questionnaire, the subjects' information,

including age and field of study; The history of using psychiatric drugs, receiving any psychological treatment during the last six months, and informed consent to participate in the study, were examined.

*B) Kessler Psychological Distress Scale (K-10):* The Kessler Psychological Distress Scale for identifying mental disorders in the general population has been developed by Kessler et al. (27) in two forms of 10 questions and six questions and has been used in various studies. These two forms are from "never" to "always" and are graded from 0 to 4. Therefore, the maximum score is 40. The 10-question form contains ten questions that do not target a specific psychological disorder, but in general, it determines the level of anxiety and depressive symptoms that a person has experienced in the last few weeks.

To build this scale, Kessler et al. (27) first collected and classified 5,000 questions from various sources, and after classifying them based on existing mental disorders, reduced the number of questions to 45 and then to 32 questions. With the initial implementation of the questionnaire by telephone and statistical analysis, they extracted 10 and 6 question versions. The study of Won and Hae (28) has shown that the K-10 questionnaire has good validity and reliability. In Iran, Yaghoubi (29), in a study on students, showed that this questionnaire has an internal consistency (0.93) appropriate and acceptable. In addition, the reliability coefficient of half-splitting and Spearman-Brown (0.91) was obtained. The criterion validity of this questionnaire is confirmed by calculating its cut-off point, which reflects its correlation with the criterion variable (composite international diagnostic interview form). The most important concepts of shear point are the sensitivity, specificity, and general classification error according to which the shear point is selected. Sensitivity, specificity, and classification error for the best cut-off point of the psychological distress questionnaire that eight were obtained were 81%, 80.5%, and 16.5%, respectively. Also, the cutting point was obtained by considering the maximum sensitivity (100%) of 27 points. This questionnaire was used to screen for mental disorders in students.

*C) Ryffs Scales of Psychological Well-Being (RPWB):* This questionnaire was designed by Ryffs (30) to assess six aspects of psychological well-being. In this questionnaire, 14 questions

were considered for each aspect. Each of the 84 questions in this questionnaire is graded on a 6-point scale from strongly disagree to agree strongly. Some questions are scored directly, and some in reverse. In questions that are scored directly, they receive an opposite answer, a score of 1, and an entirely positive answer, 6. A higher score indicates higher psychological well-being. In this scale, to determine the scores of each subscale, the scores of their questions are added together, and the total score of the questionnaire is equal to the sum of the scores of the total questions of all subscales. Ryffs (30) increased the internal consistency coefficient of the subscales between 0.86 and 0.93, and the reliability coefficient of the six-week retest on a sample of 117 people achieved between (0.81) to (0.86). Ryffs (30) also found the correlation between this scale and life satisfaction scale (0.73), Rosenberg self-esteem scale (0.62), and Zonk depression scale (-0.60) with a significance level  $P=0.01$ . Bayani, Kouchaki, and Bayani (31), in a sample of 145 students, examined the validity and reliability of this questionnaire. In this study, Cronbach's alpha method was used to calculate the reliability. The reliability coefficients of the factors were 0.59, 0.66, 0.65, 0.75, 0.57, and 0.76, respectively, and for the whole scale, was obtained 0.89. The validity of the scale was calculated by calculating the correlation coefficient of this questionnaire with the Life Satisfaction, Oxford Happiness, and Rosenberg Self-Esteem Questionnaire. This correlation was obtained 0.48, 0.58, and 0.17 with a significance level of  $P=0.01$ . This questionnaire was used to measure moral welfare.

*D) Savoring Beliefs Inventory (SBI):* Research shows that people's beliefs about the capacity to enjoy positive outcomes are a form of perceived control over positive emotions independent of beliefs about coping (a form of perceived control over negative emotions). The SBI 24-item questionnaire is a valid and reliable measure of people's beliefs about the capacity to enjoy positive experiences by predicting pleasure, enjoying the moment, and staying happy. This questionnaire has a positive relationship with extraversion, optimism, internal control, self-control behaviors, life satisfaction, implementation of values, self-esteem, intensity, and frequency of happiness (correlation between 0.17 to 0.49) with a significant level  $P=0.05$ . It has a negative

relationship with neuroticism, lack of pleasure, hopelessness, depression (correlation between -0.19 to -0.58) with a significant  $P=0.01$  (32). An example of a questionnaire: "I can make myself feel good by remembering pleasant events from the past.", "I feel like I can fully understand the good things that were happening to me", "I can enjoy the positive events in my mind before they happen". Cronbach's alpha coefficient for the whole scale was 0.90, and Cronbach's alpha range for subscales was 0.68 to 0.89 (32). Because the psychometric properties of this questionnaire have not been studied in Iran, in the first step of the study, this questionnaire was translated, and its validity and reliability were calculated. In confirmatory factor analysis, the five factors of predicting pleasure, not predicting pleasure, enjoying at the moment, maintaining pleasure, and not maintaining pleasure have validity and reliability. Cronbach's alpha coefficient of the subscales was 0.75, 0.70, 0.88, 0.79, 0.76 and for the whole scale 0.94, respectively. The reliability coefficient of retesting after two weeks on a sample of 30 people was obtained 0.70, 0.72, 0.91, 0.62, 0.64, 0.87, and for the whole scale was obtained 0.87. The results also showed that "perception of pleasure" has a significant positive relationship with self-esteem ( $r= 0.38$ ), life satisfaction ( $r= 0.47$ ), extraversion ( $r= 0.46$ ) and optimism ( $r= 0.53$ ) with a significant level  $P=0.01$  and has a significant negative relationship with neurosis ( $r= -0.35$ ) and despair ( $r= -0.62$ ) with a significant level  $P=0.05$  and has no relationship with desirable social behavior. Questions 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 are scored in reverse. Questions 2, 5, 8, 11, 14, 17, 20, 23 measure the "pleasure in the moment" subscale, questions 1, 7, 13, and 19 measure "pleasure prediction", questions 4,10,16,22 measure "lack of pleasure prediction", questions 3, 9, 15, 21 measure "pleasure retention" and 6,12,18,24 measure "lack of pleasure retention" (33). This scale was used to measure the variable "perception of pleasure".

*E) Experience Questionnaire (EQ):* The Experiences Questionnaire is a self-report questionnaire developed by Fresco et al. (34) to assess an individual's ability to "decentralize." The experiments questionnaire has good internal consistency in the non-clinical student and clinical sample (0.83 and 0.90, respectively). This questionnaire is 11 items and evaluates the items based on Likert 1 to 5;

Therefore, distance scores can range from 11 to 55, with higher scores indicating greater distances. This is an example of the utterance of this tool: "I can be cool in difficult times". The results of convergent and differential validity show that the experience questionnaire has a significant positive correlation with re-evaluation and a significant negative correlation with experiential avoidance, mental rumination, emotional suppression, and self-reported scales of symptoms of depression and anxiety (34). Psychometric properties of the EQ in the Iranian sample showed that Cronbach's alpha coefficient of the decentralization scale is 0.82. For convergent validity, the Emotional Regulation Questionnaire re-evaluation subscale was used, and the correlation coefficient with a significance level was obtained at 0.46. In order to evaluate the differential validity, Beck Depression Inventory and Beck Anxiety Inventory were used, and the correlation coefficient -0.54 and -0.36 with significance level  $P=0.01$  were obtained (35). In this study, this questionnaire was used to measure decentralization.

*F) Mindfulness-Based Cognitive Therapy (MBCT) Protocol:* In this study, the guide of cognitive intervention based on the presence of mind was written by Teasdale, Williams, and Segal (36). This program is applicable in the form of an eight-week course. The focus of the program each week is on creating different aspects of the state of mindfulness so that the person can recognize this state and learn to take the mind out of the state of mindfulness and reach the state of being. This program was performed by a person trained in MBCT who had a doctorate in clinical psychology (the first author of the current study).

Week 1: Communicating, moving the path of life from automatic guidance to a life full of awareness and conscious choices (moment-by-moment awareness of thoughts, feelings, and bodily sensations do not return to the same old mental roots that may have been troublesome in the past). Week 2: Moving from experiencing through thinking to direct experience (practicing body examination, presence of mind from breathing)

Week 3: Bringing the mind from a state of immersion in the past and the future to a state of complete presence in the present moment (practice breathing and body review, sitting meditation, and doing yoga stretching exercises to stay focused on the present).

Week 4: Give up futile attempts to avoid unpleasant experiences and face them willingly. Awareness of experiencing events to react consciously; until the person notices unpleasant feelings or a feeling of tightness or stiffness in the body and responds with proper use of breathing space instead of an automatic, measured response. (Sitting meditation and presence of mind of breath, body, sounds, thoughts, and consciousness without choice)

Week 5: Ignoring the need to change the situation and accept the situation as it is. Allowing the experience to be present, precisely as it is, without judging it or trying to change it from what it is. (sitting meditation, meditation to deal with problems and difficulties, etc.)

Week 6: Moving from real and realistic thoughts to accepting them as a set of mental events that may have no bearing on reality (ways in which thoughts can be seen differently, writing useless and unconstructive thoughts, meditating, sitting, three-minute breathing space, counterattack breathing space). Week 7: Stop being unkind to yourself and step on the path of kindness (kindness in action, writing enjoyable and masterful activities and ways to add these activities to daily life, practicing the presence of a stable mind, and writing a pattern of daily exercises)

Week 8: Planning for the future with the presence of the mind (week 8 is the rest of life, practicing body examinations, helping to recognize early and respond more skillfully to the root patterns of the mind that generate emotional distress, cultivating a new way of being). To conduct this study, an announcement was first made at the Shahid Avini girls' dormitory level, and undergraduate students living in the dormitory were invited. People who volunteered to participate in the study contacted the registrant (graduate student) to register. Sixty-two people initially registered.

During an interview by the researcher and the completion of the screening questionnaire (K10) by the participants, the entry and exit criteria were examined, eight people were left out of the final list due to not meeting the entry and exit conditions, and 54 people remained.

Criteria for inclusion in this study were: consent to participate in the study and signing a written consent, having emotional signs and symptoms based on the k-10 screening test (score 27-12), undergraduate student, and age range 18 to 22 years. Exclusion criteria were:

unwillingness to continue the treatment process, obtaining a score higher than 27 in the K-10 questionnaire, receiving any type of psychological treatment in the last six months (based on the information of the researcher-made questionnaire), and receiving psychiatric medication in six last month (based on researcher-made questionnaire information).

The registrant (graduate student) invited 54 participants to conduct the introductory session. In this session, after completing the consent form by the participants to participate in the intervention program and completing the pre-test questionnaires, students were provided with information about the research program and ethical issues. Finally, 14 people did not complete the written form of informed consent due to academic problems and unwillingness to participate and were excluded from the study. Then, the participants were randomly divided into four experimental groups (40 people).

The first experimental group participated in the first and second sessions, the second experimental group in the first to fourth sessions, the third experimental group from the first to the sixth session, and the fourth experimental group from the first to the eighth session in mindfulness-based cognitive intervention sessions. All groups completed post-test questionnaires after the intervention sessions. Due to ethical issues, the sessions of the first, second, and third groups continued until the eighth session (many people did not continue more sessions after the sessions related to their group). Purpose and timing of all questionnaires completed by participants in the baseline and intervention stages. The researcher conducted intervention sessions in all groups using the same protocol. The therapist has completed training in the principles of psychological therapy and is proficient in mindfulness-based cognitive presence intervention. The content of the sessions, methods, and techniques was based on the protocol of cognitive intervention based on the presence of mind. Therapeutic sessions of each group were performed weekly for two hours. Therefore, it is better to understand when the changes start; do they occur slowly during treatment, or do most changes occur at a particular stage or end of treatment? In addition to using descriptive statistics, this study used a multilevel analysis method to test the research hypotheses (37,38). Multilevel analysis is commonly used to analyze data at more than one level.

## Results

Participants in this study included four groups of 10 people with a mean age of about 20.58 (SD = 1.41) years. The analysis of variance showed that there was no significant difference between the groups in terms of age ( $P = 0.41$ ). Most of the participants in the study were

studying in the faculty of humanities (70%) and the fifth to eighth semesters (70%) and were single in terms of marital status (90%). Table 1 presents descriptive indicators of well-being (self-acceptance, positive relationships with others, autonomy, environmental control, purposeful living, and personal growth).

**Table 1.** Comparison of well-being means decentralization and perception of pleasure

Variable	Treatment groups	Average	The square of Estimated variance	95% confidence interval	
				High limit	Low limit
Rehabilitation	Before intervention	307.40	3.13	313.54	301.25
	Second week	308.49	6.60	321.43	295.54
	Forth week	315.46	4.48	324.24	306.67
	Sixth week	315.31	4.54	324.20	306.42
	Eighth week	325.93	6.68	339.02	312.83
Your acceptance	Before intervention	49.57	0.76	51.05	48.09
	Second week	47.88	1.43	50.68	45.08
	Forth week	54.72	1.05	56.78	52.66
	Sixth week	51.83	1.19	54.16	49.50
	Eighth week	53.65	1.32	56.23	51.07
Positive relationships with others	Before intervention	52.53	0.84	54.18	50.89
	Second week	52.54	2.01	56.49	48.60
	Forth week	52.67	0.88	54.40	50.95
	Sixth week	51.26	1.86	54.91	47.61
	Eighth week	53.82	2.06	57.86	49.78
Autonomy	Before intervention	52.42	0.85	54.08	50.75
	Second week	54.50	2.40	59.21	49.79
	Forth week	53.56	0.96	55.45	51.68
	Sixth week	55.64	1.14	57.87	53.40
	Eighth week	53.73	1.10	55.89	51.56
Mastery of the environment	Before intervention	51.80	0.80	53.37	50.22
	Second week	51.20	1.50	54.13	48.26
	Forth week	50.84	1.03	52.86	48.82
	Sixth week	51.83	1.39	54.55	49.10
	Eighth week	53.27	1.25	55.72	50.82
Objective life	Before intervention	48.65	0.85	50.32	46.98
	Second week	48.65	1.80	52.17	45.13
	Forth week	50.12	1.42	52.90	47.34
	Sixth week	50.49	1.25	52.94	48.05
	Eighth week	52.83	1.81	56.37	49.28
Personal growth	Before intervention	52.48	0.71	53.87	51.09
	Second week	54.53	1.20	56.87	52.18
	Forth week	54.59	1.38	57.31	51.88
	Sixth week	54.75	0.91	56.53	52.97
	Eighth week	55.31	1.23	57.71	52.90
Decentralization	Before intervention	32.57	0.88	34.29	30.84
	Second week	34.30	2.48	39.16	29.45
	Forth week	35.32	2.06	39.35	31.29
	Sixth week	35.56	0.93	37.39	33.74
	Eighth week	38.16	1.68	41.45	34.87
Understanding pleasure	Before intervention	5.12	0.12	5.36	4.89
	Second week	5.17	0.18	5.53	4.82
	Forth week	5.37	0.16	5.68	5.07
	Sixth week	5.19	0.21	5.60	4.78
	Eighth week	5.62	0.25	6.11	5.13

As shown in Table 1, the mean of the welfare variable was 307.40 before the intervention and reached 325.93 during an incremental process in the eighth session. The mean of the acceptance scale was 49.57 before the intervention. The scores in the second week were decreased by about two points (47.88). The sixth week (51.83) compared to the fourth week (54.72) has decreased about three points. There was an increasing trend in the fourth week (54.72) compared to the second week and in the eighth week (53.65) compared to the sixth week.

The mean of positive relationships with others before the intervention was 52.53, then in the second to sixth weeks of the intervention was oscillating and in the eighth week reached 53.82. The mean score of autonomy before the intervention was 52.42. It has fluctuated in the following weeks.

The second week reached 54.50, in the fourth week reached 53.56, in the sixth week reached 55.64 and in the eighth week reached 53.73. The average score of mastery of the environment before the intervention was 51.80, and during the following weeks of the intervention had an increasing trend and reached 53.27 in the eighth session. The mean before the purposeful life intervention was 46.65 and then in an incremental process in the second, fourth, and sixth sessions, in the eighth session reached 52.83.

The mean of individual growth before the intervention was 52.48 and, during an increasing process in the second, fourth, and sixth weeks, in the eighth session, reached 55.31. The mean score of decentralization of participants before the intervention was 32.57, and in the second, fourth, sixth, and eighth weeks has increased and reached 38.16.

The pleasure perception variable was obtained before the intervention of 5.12, and in the second, fourth, sixth, and eighth sessions, in a somewhat incremental process reached 5.62.

One-way analysis of variance (ANOVA) was used to evaluate the differences between groups in terms of pre-test scores.

The results showed no significant difference between the four intervention groups regarding pre-test scores in the psychological distress questionnaire, perception of pleasure, decentralization, and well-being and its dimensions. In order to answer the research questions, the Generalized Estimating Equations (GEE) method was used. Results

were reported based on beta model coefficients in all four groups. This method is one of the most suitable methods in analyzing correlated data that has been collected through longitudinal, nested, and repeated size designs. The results are shown in Table 2.

As shown in Table 2, despite the increase in the welfare variable over time compared to the welfare at the beginning of the study, after eight weeks of intervention, the welfare variable became significant ( $P= 0.01$ ).

The acceptance variable decreased by about two points in the second week compared to before the intervention, but this decrease was not significant, then in the fourth week, it increased by 7 points, and this increase became significant ( $P= 0.001$ ).

Finally, in the sixth week, compared to the fourth week, the increasing trend decreased significantly by three points ( $P= 0.05$ ), then in the eighth week, two scores increased significantly ( $P= 0.002$ ).

Comparison of the beta coefficients of the autonomy variable shows that after six weeks of intervention, the increasing trend of the autonomy subscale has become significant ( $P= 0.01$ ), but in the eighth week, the beta rate has decreased compared to the sixth week, but this decrease is not significant.

The results of the individual growth subscale in Table 2 show that this variable had an increasing process during the intervention and was significant in the sixth ( $P= 0.03$ ) and eighth ( $P= 0.05$ ) sessions. Positive relationships with others despite an increasing trend in the second, fourth, sixth, and eighth weeks, this process has not been significant. The beta coefficients for the second, fourth, sixth, and eighth weeks of the environmental mastery subscale are not significant in Table 2.

The trend of purposeful life change during the presence of mind intervention was based on incremental cognition, which became significant in the eighth session of the intervention ( $P= 0.04$ ).

The decentralization variable has an increasing trend over time and this trend in the fourth week ( $p = 0.04$ ), sixth ( $P= 0.001$ ) and the eighth ( $P= 0.001$ ) became significant.

Pleasure perception variable except for the sixth week, which had a decreasing trend, and this decrease was not significant; in other weeks of intervention, there has been an increasing trend; this upward trend has become significant in the eighth session.

**Table 2.** Comparison of model beta coefficients in baseline, second, fourth, sixth and eighth weeks

Variable	Parameter	Beta	standard error	P
Rehabilitation	Before intervention	307.39	3.13	
	Second week	308.48	6.60	0.87
	Forth week	315.45	4.48	0.08
	Sixth week	315.30	4.53	0.07
	Eighth week	325.92	6.68	0.01
Your acceptance	Before intervention	49.56	0.75	0.23
	Second week	47.87	1.47	0.23
	Forth week	54.72	1.04	0.0001
	Sixth week	51.82	1.10	0.05
	Eighth week	53.64	1.23	0.002
Positive relationships with others	Before intervention	52.53	0.84	
	Second week	52.54	2.01	0.99
	Forth week	52.67	0.87	0.87
	Sixth week	52.83	1.86	0.49
	Eighth week	53.82	2.06	0.52
Autonomy	Before intervention	52.41	0.84	
	Second week	54.50	2.40	0.42
	Forth week	53.56	0.96	0.32
	Sixth week	55.63	1.14	0.01
	Eighth week	53.72	1.10	0.37
Mastery of the environment	Before intervention	51.79	0.80	
	Second week	51.19	1.49	0.73
	Forth week	50.83	1.03	0.37
	Sixth week	51.82	1.39	0.98
	Eighth week	53.26	1.25	0.3
Objective life	Before intervention	48.64	0.85	
	Second week	48.65	1.79	0.99
	Forth week	50.11	1.41	0.32
	Sixth week	50.49	1.24	0.21
	Eighth week	52.82	1.80	0.04
Personal growth	Before intervention	52.47	0.71	
	Second week	54.52	1.19	0.11
	Forth week	54.59	1.38	0.16
	Sixth week	54.75	0.90	0.03
	Eighth week	55.30	1.22	0.05
Decentralization	Before intervention	32.56	0.88	
	Second week	34.30	2.47	0.49
	Forth week	35.32	2.05	0.04
	Sixth week	35.56	0.93	0.001
	Eighth week	38.15	1.67	0.001
Understanding pleasure	Before intervention	5.12	0.11	
	Second week	5.17	0.18	0.80
	Forth week	5.37	0.15	0.08
	Sixth week	5.18	0.20	0.75
	Eighth week	5.62	0.24	0.03

## Discussion

The present study results indicate the effectiveness of the mindfulness-based cognitive intervention on increasing well-being and increasing decentralization variables and well-being subscales (self-acceptance, autonomy, personal growth, and purposeful living).

Consistent with the present study, the results of the study of Ahmadi et al. (39), which was conducted with the aim of the effectiveness of mindfulness-based cognitive therapy on the mental well-being of anxious students and with the help of Spielberger State-Trait Anxiety Inventory (STAI) and Subjective Well-Being Questionnaire (SWQ), showed that mindfulness-based cognitive therapy is a useful and effective strategy to increase mental well-being and reduce negative emotions in anxious students.

Also, the results of the study of Alimoradi et al. (40), which aimed to evaluate the effectiveness of MBCT on reducing depression and increasing the quality of life of women with addicted husbands with the help of the Beck Depression Inventory and Quality of Life Questionnaire (QOL), in line with the current study showed that MBCT was influential on the quality of life of women in the experimental group. In other words, the average quality of life in the experimental group post-test was higher than the quality of life test in the control group and increased the quality of life in women in the experimental group. The present study's findings are also consistent with research on the effectiveness of MBCT on quality of life, including Solati et al. (41), Malm et al. (42).

The results of a study by Park et al. (43), which aimed to investigate the effect of MBCT on psychological distress, fear of cancer recurrence, psychological well-being, and quality of life in patients with breast cancer showed that patients in the MBCT group in comparison to control group showed better results in psychological distress, fatigue, spiritual well-being and quality of life. These differences also persisted for four weeks after treatment.

Explaining these results, it can be said that MBCT can increase the preventive aspect of treatment by changing defective patterns of thinking and training attention control skills. MBCT, by encouraging the practitioner to pay attention to the characteristics of experiences in

non-judgmental ways, leads to more specific coding of information in the narrative memory, which in turn can lead to a more specific re-reading of memory (44), therefore in mind-based therapy, by changing the relationship with cognitive content (decentralization) and managing thought processes, one can help people with cognitive dysfunctional content without extensive challenge. Research shows that the presence of the mind helps to recognize, manage and solve everyday problems and leads to psychological well-being and mental health (45). Although studies in the non-clinical field are limited, research in a healthy population also shows that mindfulness training has many psychological, emotional, and physical benefits (46). Based on the results, the variables of "decentralization" and the subscale of "self-acceptance" increased significantly from the fourth session. Then "individual growth" and "autonomy" in the sixth session and "purposeful life" in the eighth session showed a significant incremental process.

Does increasing "decentralization" and "self-acceptance" play a role in increasing "personal growth", "autonomy" and "purposeful living"? Will the cumulative effect of these variables lead to an increase in well-being in the eighth session?

From the beginning of the intervention, incremental variables were observed. However, these changes became significant from the fourth session with increasing decentralization, self-acceptance, and the sixth session with increasing personal growth, autonomy, and finally, the eighth session with the increasing perception of pleasure, purposeful life, and well-being. Are we facing a situation like a stimulus threshold? It seems that by increasing the variables of decentralization and self-acceptance, the movement towards autonomy and personal growth begins and eventually ends in well-being.

The acceptance variable has significantly increased in the fourth and eighth sessions. In the first to fourth weeks, participants learn to approach all of their unpleasant feelings, thoughts, and emotions, see how they respond to that unpleasant feeling in their body, and recognize the signs of rejection and disgust. In other words, they "observe" and "accept" their thoughts by using techniques such as sitting meditation, recognizing the sign of turning away, and the presence of the mind from thoughts and sounds. These techniques lead to

increased decentralization and acceptance among participants.

Acceptance of inner experiences has been considered as a mechanism of mind presence; Acceptance of inner experiences can be generalized to self-acceptance (47). Autonomy refers to self-regulation of emotions, and autonomy refers to regulation without self-approval. Autonomy is closely related to phenomena such as choice and freedom and is proposed in the framework of the self-determination theory (48).

Within the framework of self-determination theory, there is a belief that supporting basic psychological needs is essential to the well-being of all individuals. Autonomy is considered the main feature of health and is strongly correlated with psychological well-being (48,49). Individual differences in autonomy predict well-being (48).

Attention, along with the presence of the mind, increases awareness of one's needs so that the individual responds more skillfully to how they regulate their behavior (50).

Practicing mindfulness helps increase the attainment of pleasurable experiences through the ability to focus on positive stimuli. For example, the presence of the mind increases awareness of inner experiences, including satisfaction and happiness. In this way, the presence of the mind gives people the opportunity to understand pleasure and maintain such feelings. Decentralization has been introduced in previous research as a central mechanism of mind presence whose role has been to reduce negative variables. These variables in this study have also played a role in increasing the positive variables. Therefore decentralization can play a role in negatives, reducing variables and increasing positive outcomes. It also seems logical that mindfulness programs should be extended to non-clinical examples to increase positive variables such as autonomy, self-acceptance, and perception of pleasure. One of the limitations of the present study was the selection of a sample from a limited community (female students living in dormitories) and with a limited volume (ten people in each group). However, significant findings from smaller

samples are more accurate; due to the limited number of samples and the selection of the research sample from the student population, the external validity of the research decreases.

Another limitation of the study was the lack of follow-up intervention. Therefore, it is suggested that similar studies be performed on different samples with different demographic characteristics and larger volumes so that the research results can be generalized with more confidence and follow-up sessions can be conducted.

Focusing on mindfulness mechanisms that reduce negative variables indicates the widespread use of mindfulness-based interventions in clinical populations to reduce negative variables (51) because mindfulness training has a wide range of psychological and emotional benefits in a healthy population (52), it is suggested that therapists use this approach to increase well-being, autonomy, self-acceptance and perception of pleasure in individuals, including students. Given that MBCT can increase positive outcomes such as well-being in the non-clinical population, it is suggested that these interventions be used as a protective factor for mental health in various non-clinical groups. It is also suggested that clinical psychologists, in addition to identifying and intervening in reducing negative variables (such as anxiety, depression, etc.), also accurately assess positive variables such as perception of pleasure and well-being (such as autonomy and self-acceptance). If necessary, consider programs to increase positive variables and improve clients' well-being.

## Conclusion

In summary, the present study indicated the positive effects of Mindfulness-Based Cognitive Therapy (MBCT) on increasing students' well-being and well-being subscales (self-acceptance, autonomy, personal growth, and purposeful life).

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