Effectiveness of Mindfulness-Based Cognitive Therapy on Reduction of Depression and Anxiety Symptoms in Mothers of Children With Cancer

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Abstract

Background: Findings demonstrated that parents of children with cancer experience elevated levels of distress, depression, anxiety, posttraumatic stress symptoms, and subjective symptoms of stress. In this study, we determined effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on reduction of depression and anxiety symptoms in mothers of children with cancer.

Methods: Four mothers whose children had cancer were diagnosed to have depression and anxiety symptoms, using Beck Anxiety Inventory, Beck Depression Inventory II, and Structured Clinical Interview for DSM-IV. They were selected through purposeful sampling to participate in this experimental single-case study. After the baseline was determined, subjects attended an eight-session program of Mindfulness-Based Cognitive Therapy.

Results: The comparison of baseline and post-test showed that depression and anxiety symptoms decreased through MBCT. Improvement quotient for depression and anxiety of each subject was good.

Conclusion: Data showed that MBCT reduced depression and anxiety symptoms in mothers of children with cancer.

Keywords: Cognitive therapy; Depression; Anxiety; Child; Cancer

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Introduction

Cancer is one of the major causes of childhood death in the developed and developing countries. It accounts for 4% of death of children under 5 years of age and 13% of children 5–15 years of age in the Iranian population; contributing to 15% of total loss of life in the under 15- year age group [1]. However, despite the greatly improved clinical outcomes, children with cancer and their parents continue to experience significant distress throughout the course of the diagnosis and illness. A number of previous investigations demonstrated that parents of children with cancer experience elevated levels of distress [2-4]. Findings vary based on measurement, but the most commonly identified types of distress are depression, anxiety, posttraumatic stress symptoms, and subjective symptoms of "stress". It is estimated that moderate and severe symptoms of distress range from 15% to 51% [5-7], especially in mothers [8, 9] who report more emotional problems than fathers [10, 11].

To date, there have been a few studies that have used parents as facilitators during their children's medical procedures. In fact, some studies [12-14] have designed stress management programs specifically for parents of children undergoing medical procedures. Intervention programs generally incorporate procedural information and coping skills training (i.e., muscle relaxation, deep breathing, visual imagery, and positive self-statements) [15]. MBCT includes mindfulness practices designed to cultivate nonjudgmental observation and acceptance of bodily sensations, cognitions, and emotions. Participants learn to engage in sustained observation of these phenomena, with an attitude of interest and curiosity, and to accept them as they are, without trying to change or escape them. MBCT also includes elements of cognitive therapy that are consistent with nonjudgmental acceptance of the experience. A

Table 1. Characteristics of mothers and their children

	A participant	B participant	C participant	D participant
Age of child(years)	8	12	7	5
Gender of child	Boy	Girl	Boy	Boy
Since of diagnosis	12 months	15 months	12 months	8 months
Type of childhood cancer	ALL	ALL	Neuroblastoma	ALL
Age of mother(years)	34	47	41	37
Occupation of mother	Householder	Emeritus	Employed	Householder
Number of children	2	3	3	2

decentered view of thoughts is emphasized, in which participants are encouraged to view their thoughts as transient mental events rather than as aspects of themselves or as necessarily accurate reflections of reality or truth [16]. It is claimed that this interventional method has just recently been invented by cognitive therapists. However, historically the method had been considered by Islamic philosophers few centuries ago i.e: Imam Fakhr Razi who suggested the theory of imagination without judgment [17].

The present study sought to evaluate the effectiveness of MBCT on reduction of depression and anxiety symptoms in mothers of children with cancer. The present study is an effectiveness study and not an efficacy study. Efficacy studies examine the effects of treatment in randomized controlled trials, involving recruited patients, using a highly structured treatment manual for a narrow problem focus. Effectiveness studies examine the effects of treatment conducted in non research based clinical settings and purposive sampling. The aim of such research is to maximize the external validity or generalization of results to various settings.

Materials and Methods

Participants

Mothers were recruited for participation in the study at Dr. Sheikh Hospital and Ghaem Paediatric Radiology Clinic over a 6-month period through purposeful sampling. A psychiatrist screened interested subjects for inclusion and exclusion criteria. Inclusion criteria were (A) possessing 19 score and above in Beck Depression Inventory-II (BDI-II); (B) 15 score in Beck Anxiety Inventory (BAI); (C) meeting criteria for anxiety and depression determined by the modified version of the Structured Clinical Interview for DSM IV [18]; (D) medically stable. Patients with comorbid current major depression, substance abuse and/or dependence and psychosis were excluded from the study because of low concentration and orientation. Four mothers participated in the study. One child was a girl and three were boys (ages 5-12). One child was diagnosed by Neuroblastoma, and three by Acute Lymphoblastic Leukaemia (ALL). All the children lived with their parents. This paediatric treatment center had a social worker but s no treatment, systematic approach or recommendations were offered at this center regarding how mothers' anxiety and depression should be handled during their children's treatment procedures. (Table 1)

Procedure

The method used in this study was the single-case experimental design. In analyzing the data in the single case study, the dependent variable for the possible changes resulting from the independent variable can be read in two ways [19]. The first criterion is to draw the graphs of subjects' functions at the baseline and the intervention phase, and then compare them; and the second criterion is to consider the slopes in each of the two-step graph-line during the intervention. Thus, any trends or slopes in each stage are examined. In this study, the Improvement quotient was used to show treatment effect clearly. We subtracted the pretest scores from the post-test scores and then divided the attained number by the pretest score [20].

At the baseline state including 3 times measurement following 5 days of treatment, and 10 days after the end of the treatment and 10 days after the end of the treatment for follow up, subjects completed self-report measures of anxiety, and depressive symptomatology. To monitor the changes, the measurements were also performed at end of second, forth, sixth and eighth sessions. Subjects attended in treatment for eight consecutive weeks for one hour individually.

Intervention Program

Mindfulness training teaches a way of being rather than of doing, allowing participants to step back from automatic behaviours and habitual thought patterns. MBCT is a psychological therapy which uses features of cognitive therapy with

mindfulness techniques of Buddhism. MBCT consists of accepting thoughts and feelings without judgment rather than trying to push them out of consciousness, with aim of correcting cognitive distortions. MBCT was found by Zindel Segal, Mark Williams and John Teasdale, who based MBCT on a program developed by Jon Kabat-Zinn called Mindfulness-Based Stress Reduction (MBSR), [21-23] which was adapted to use for patients with major depressive disorder. The aim of MBCT is not directly provide relaxation or happiness, but is rather a "freedom from the tendency to get drawn into automatic reactions to thoughts, feelings, and events"[23]. MBCT programs usually consist of an eight week course with two-hour classes in each session with weekly assignments to be done after the sessions. The aim of the program is to enhance awareness so clients are able to respond to things instead of react to them.

Mindfulness practice helps us to see the patterns of the mind more clearly; and to learn to recognize when our mood is beginning to go down. Mindfulness teaches us a way in which we can get in touch with the experience of being alive. Low mood can bring back memories and thoughts from the past, and make us worry about the future. Mindfulness helps to halt the escalation of these negative thoughts and teaches us to focus on the present moment, rather than reliving the past or pre-living the future. When we start to feel low, we tend to react as if our emotions were a problem to be solved: we start trying to use our critical thinking strategies. When these do not work, we re-double our efforts to use them. We end up over-thinking, brooding, ruminating, and living in our heads.

Mindfulness helps us to enter an alternative mode of mind that includes thinking but is not just thinking. It teaches us to shift mental gears, from the mode of mind dominated by critical thinking (likely to provoke and accelerate downward mood spirals) to another mode of mind in which we experience the world directly, non-conceptually, and non-judgmentally.

Mindfulness takes a different approach. It helps develop our willingness to experience emotions, our capacity to be open to even painful emotions. It gives us the courage to let distressing moods, thoughts and sensations to come and go, without battling with them [17].

Increasing ability to rest within the present moment requires training in concentration and sustained attention. Patients are trained to ground themselves in the moment as a starting point, for example, by paying attention to the movement of the breath or to body sensations. The body and the breath are constantly present, and the mind can return to them whenever awareness is lost. Participants in the classes discover that they cannot be fully aware of body sensations or the breath from moment to moment, if their minds wander off to another place or time.

The body scan practice is designed to increase patients' ability repeatedly to engage, sustain, and then disengage attention. Participants move a focused spotlight of attention from one part of the body to another, as if they could "breathe in" to each location and explore sensations in depth just as they are before letting go and moving on. Participants are encouraged to approach whatever sensations arise with an attitude of kindness, open curiosity, without judging them. When the mind wanders, they are invited simply to notice where it has gone and gently to shift attention back to the body.

By staying with the body scan, mothers had an opportunity to notice how their experience changed from moment to moment and to practice a different way of responding to intense, uncomfortable sensations.

Developing nonjudgmental awareness of thoughts, body sensations, and physical stimuli (sights, sounds) facilitates adoption of this same nonjudgmental attitude when responding to negative thoughts, for example, about the self. Training in awareness of thoughts occurs later in the program, during sitting meditations. Participants develop an ability to see thoughts as mental events that pass through the mind, rather than as facts or central parts of their identity. For example, one exercise involves imagining thoughts that arise during sitting meditation as passing images on a cinema screen or as leaves floating past on a river. When mothers used this technique, they were surprised to discover that sustained but decenterd attention to the thoughts caused them to lose their ability to provoke an emotional reaction. The subjects found that many thoughts disappeared altogether as they watched them come and go; and this made them to be keen to experience their thoughts and emotions by this technique in other situations. Their attitudes toward their thoughts changed from fear and sadness to investigative curiosity.

Therapeutic Package

In this study, the interventions included in our manual were provided in eight sessions.

In the first session, goals and techniques included building a rapport with the client, obtaining

information from the client, providing psychoeducation on mindfulness, CBT, depression, and anxiety, identifying automatic thoughts and leading the client through a guided mindfulness meditation.

In the second session, goals and techniques included helping the client recognize that most of her thoughts are not facts, teaching the client to use the thought record, educating client about cognitive distortion.

Goals and techniques in the third session included educating diaphragmatic breathing and sleep hygiene; next, teaching the client a brief body scan exercise to reduce muscle tension.

In the fourth session, goals and techniques included introducing mindful daily activity, teaching mindful eating and mindful labelling on thoughts, feelings and behaviours.

In the fifth session, goals and techniques include to enhancing recognition of personal consequences of chronic worry, having the client perform a cost-benefit analysis of her chronic worry, scheduling worry time and mindful worry-free zones.

Goals and techniques in the sixth session included generating a hierarchy of worries, imaginary exposure with acceptance, incorporating in vivo exposure through increased participation in planned events.

In the seventh session, goals and techniques included helping the client learn to identify and respond to early signs of relapse, collaborating with the client to generate responses to her early warning signs, helping the client practice developing a worry action plan.

In the eighth session, goals and techniques included reviewing the insights and techniques found most useful by the client, identifying obstacles to practice mindfulness, providing a checklist of the techniques included in the program.

Instruments

Beck Anxiety Inventory (BAI)

The BAI (24) is a 21-item scale developed to address the need of an instrument that would reliably discriminate anxiety from depression while displaying convergent validity. Each item on the scale describes a symptom of anxiety. The items are summed to obtain a total score which range from 0 to 63. Numerous studies have reported alpha internal consistency and the results are consistent across a wide range of respondents. For example, alpha of 0.90 was found for undergraduates and alpha of 0.94 was found for outpatients with anxiety disorder. Many studies have compared the BAI with other scales. Considering concurrent validity, the correlation between the Beck Anxiety Index and the Hamilton Rating Scale for Anxiety is 0.47 and correlation with Brief Symptom Inventory (Anxiety scale) is 0.69. Discriminate validity of scale was obtained in a study of psychiatric outpatients through their anxiety (94%) [24-26].

Beck Depression Inventory-II (BDI-II)

The Beck Depression Inventory-Second Edition (BDI II) [25] is a 21-item scale and one of the most widely used self-report measures of depression. Beck cited alphas of 0.93 for college students and 0.92 for outpatients, in another study Steer et al. reported an alpha of 0.92 for the BDI-II. Beck reviewed 11 studies that showed the BDI is capable of discriminating between groups that differ in level of depression. A further 35 concurrent validation studies compared the BDI with other ratings of depression. Fourteen studies reported correlations between the BDI and clinical ratings; coefficients for psychiatric patients ranged from 0.55 to 0.96, with a mean of 0.72. The correlation between the earlier version of BDI and (BDI II) was 0/93 and kappa agreement was 0.70[26].

Results

Participant A

Diagram 1 shows that the participant's depression and anxiety level is 23 in BDI-II and 34 in BAI approximately at the baseline statement. These scores are severe and moderate rates of depression in BDI-II and anxiety in BAI. She obtained a score of 13 in BDI-II and 15 in BAI at end of session 2; and this reduction was continued except for session 6.Between fifth and seventh sessions, her child was in chronic paediatric medical condition. Her scores in posttest measurement was 10 in BDI-II and 8 in BAI that indicate reduction in symptoms of depression and anxiety. Her Improvement quotient was %78/87 for depression and %76/92 for anxiety.(Figure 1)

Participant B

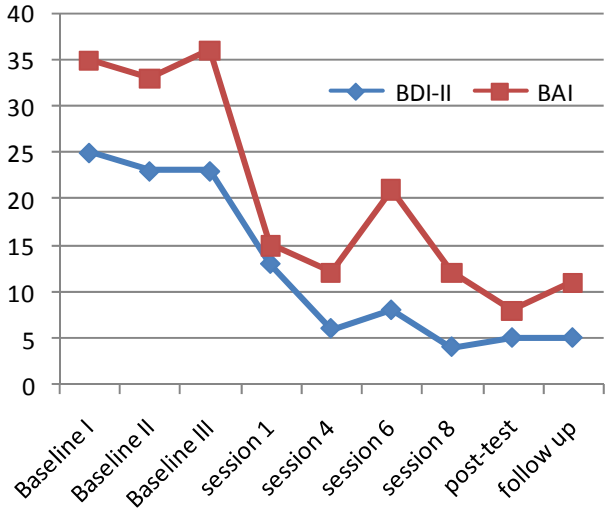

Figure 1. Anxiety and depression of participant A

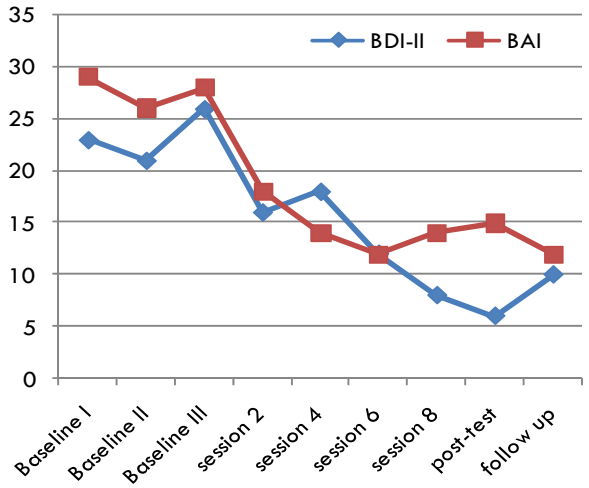

Figure 2. Anxiety and depression of participant B

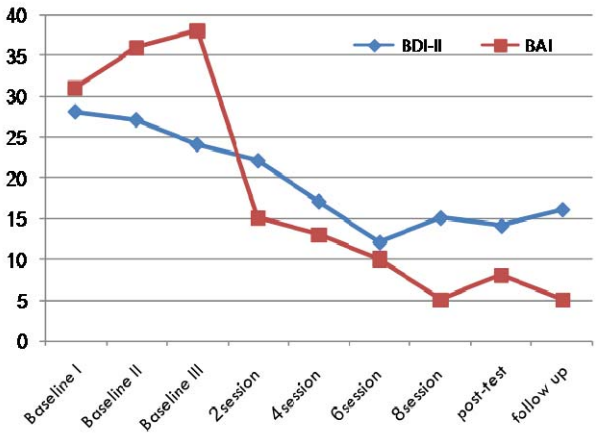

Figure 3. Anxiety and depression of participant C

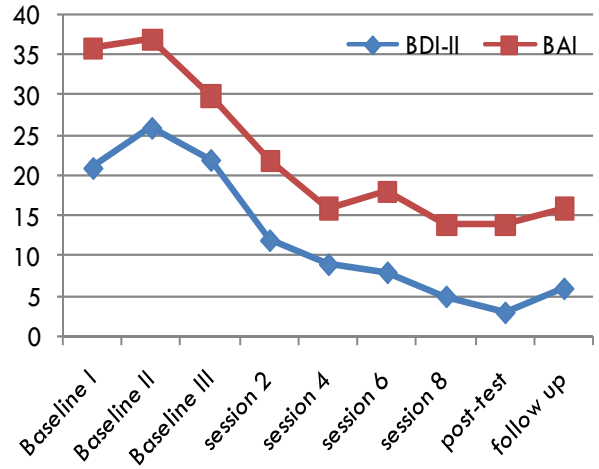

Figure 4. Anxiety and depression of participant D

Diagram 2 shows that participant's depression and anxiety levels were 19-29 in BDI-II and 26-29 in BAI approximately at the baseline statement. These scores are in severe and moderate range of depression in BDI-II and anxiety in BAI. She obtained a score of 16 in BDI-II and 18 in BAI at end of session 2. Her scores in post-test measurement were 6 in BDI-II and 15 in BAI that indicate reduction in symptoms of depression and anxiety. Her Improvement quotient was %74 for depression and %46 for anxiety.(Figure 2)

Participant C

Diagram 3 shows that participant's depression and anxiety levels are 24-28 in BDI-II and 31-38 in BAI approximately at the baseline statement. These scores are in severe and moderate rate of depression in BDI-II and anxiety in BAI. She got the score of 22 in BDI-II and 15 in BAI at the end of session 2. Her scores in post-test measurement were 14 in BDI-II and 8 in BAI that indicate reduction in symptoms of depression and anxiety. Her Improvement quotient was %46/83 for depression and %77/14 for anxiety.(Figure 3)

Participant D

Diagram 4 shows that participant's depression and anxiety levels are 21-26in BDI-II and 30-37 in BAI approximately at the baseline statement. These scores are severe and moderate range of depression

in BDI-II and anxiety in BAI. She got the score of 12 in BDI-II and 22 in BAI at the end of session 2. Her scores in post-test measurement were 7 in BDI-II and 14 in BAI that indicate reduction in symptoms of depression and anxiety. Her Improvement quotient was %86/95 for depression and %59/22 for anxiety.(Figure 4)

All participants showed scores of 21-28 at the baseline statement that indicated severe and moderate depression (19-29) in BDI-II. Visual observation of diagrams demonstrates the decline of scores. Post-test of three participants (A, B and C) is in low or no depression remain (less than 10) and one participant (D) remains in low or moderate depression (10 to 18 score).(Figure 5)

All participant possessed scores of 26-38 at the baseline statement that indicated severe anxiety (19-29) in BAI. Visual observation of diagrams demonstrated a decline of scores. Post-test of all participants showed low or moderate anxiety (8-18 score).(Figure 6)

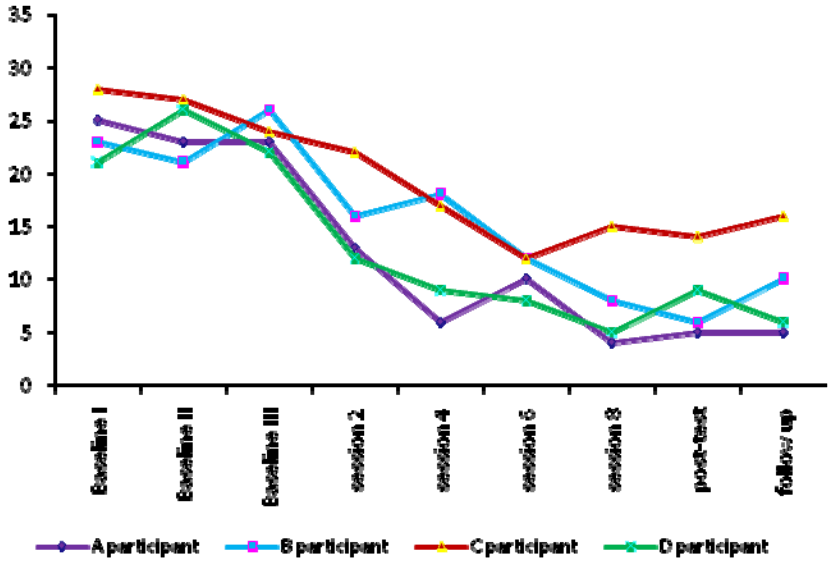

Figure 5. Depression scores of all participants in BDI-II

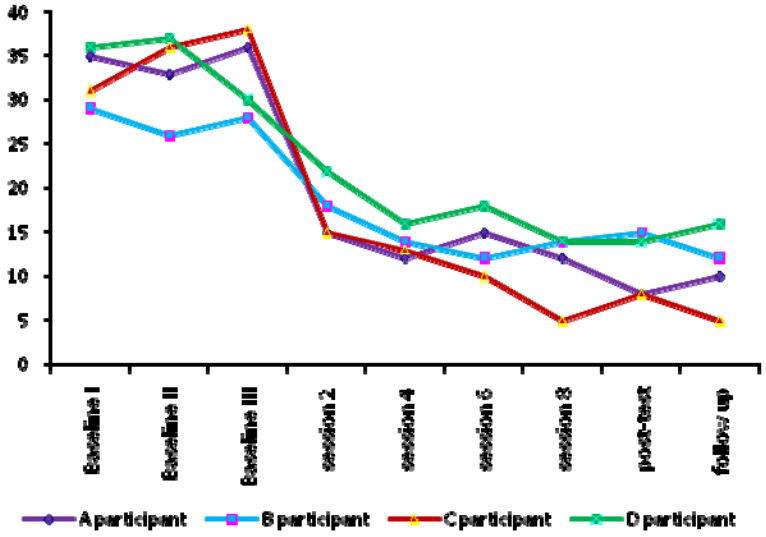

Figure 6. Anxiety scores of all participants in BAI

Discussion

There has been limited research regarding psychosocial interventions about mothers of children with cancer because their problems to be sophisticated. However, studies demonstrated that the symptoms of depression and anxiety have been reduced using Mindfulness-Based Cognitive Therapy in these mothers. The current study, which is consistent with Ingram, Hayes, and Scott theory (2000), explains the result in four areas to evaluate the performance of Cognitive Therapy [26].

Universality of change (what is the percentage of the improvement?)

Differences between base line and post-test scores demonstrated that examinees show positive improvement on both Beck depression and anxiety scales. Positive improvements of this treatment can be observed on both depression and anxiety respectively. The percentages of recovery on depression were: participant A: 78.87%; participant B: 74%; and participant C: 46.83%. Percentages of recovery on anxiety were: participant A (76.92%);

participant B: (46%), participant C: (77.14%); and participant D: (59.22%).

Generality of change (what are the changes in relation to critical situations and jobs?)

According to Harding (1996), Madan-Swain and Brown (1991), the studies showed that a child's cancer effects parents' in spending their energy on the patient [27,28] diverted all his attention to care for the sick child and find himself detached from the other family members. At the end of the final sessions, the participant found himself having a better relationship with his spouse and child. However, it should be noted that the child seeks more attention from the mother.

Watkins et al. (2001) found that after using Mindfulness-Based Cognitive Therapy on patients with depression or dysthymia, recovery can be observed on their over general autobiographical memory. Over general autobiographical memory is a capacity to recall categories of events in a coherent and continuous way when the subjects are asked to provide specific instances from their life (17). Participant B had more difficult problems with her husband about how to care for their sick child. She was suffering as a result of arguments with her husband at the presence of their child and this led to a big fight between them. At the end, she showed a significant improvement in her over general autobiographical memory and marital satisfaction.

Participant C demonstrated a better performance. She was suffering from lack of concentration and chronic fatigue in her office during work hours; she was late for work every morning and used up all her breaks and vacations that resulted in a critical job situation. At the end of the therapeutic sessions, she has shown an improvement on her anxiety symptoms by (77.8 %); however, her anxiety improvement was poor compared to other subjects (47.7%), but still significant.

Participant D also showed (86.95%) improvement in her depression rate; however, less recovery was observed on her anxiety level (59.22%). While she was undergoing therapeutic sessions for her own anxiety symptoms, she was facing her son chronic medical condition. Therefore, the result shows a strong correlation between her anxiety scores and her son relapse condition. She obtained the score of 37 on her baseline condition on Beck Anxiety Inventory. This indicated the real extent of her condition. At the end of her anxiety therapy session, her score reduced to 14 on Beck Anxiety Inventory. This could perhaps make a better situation for the sick child as well. Mohammad Valimirza [29] indicated that those children whose parents dealt with their condition more effectively, experience less situational anxiety.

Safety

Comparing the participants' scores at base line, post-test, and follow up in both depression and anxiety showed a great deal of improvement on the scales, and led to a full recovery. However, the range of recovery was different from patient to patient. Surprisingly, this treatment approach did not show any side effects.

Stability (Treatment Achievements)

Follow up result (30 days after the last therapy session and 5 days after post-test) indicated that depression of participants A and D both maintained in the score of less than 10 which indicates the state of no depression or least depression. Participant B with the score of 10, and participant C with the score of 16 were categorized in a range of 10-18 with a diagnosis of mild to moderate depression; and it can be stated that MBCT provided them with a relative stability. Anxiety of participants A, B, and C with the score of 11, 12, and 5 respectively indicated the effectiveness of this kind of treatment for anxiety. Participant D, with 1 score above the cut of point (15), represented a poorer result in regards to the therapy achievements.

Conclusion

In summary, the current study demonstrated that Mindfulness-Based Cognitive Therapy has a significant effect on both depression and anxiety on our sample. The anxiety and depression both changed in different ways. According to psychological interviews which the therapist carried out with mothers, this treatment approach significantly improved the relationship of these mothers with themselves, and their family, and also improved their social functions. The results have coherency with studies which emphasize the effectiveness of MBCT for treatment of depression, anxiety and stress and to improve psychosocial adjustment of people [21- 23].

Because psychological conditions of mothers can affect their children wellbeing, it is suggested that future research concentrate on direct effectiveness of MBCT on the mothers and on indirect improvement of medical condition of children with cancer.

As mentioned in the article, the root of mindfulness can be found in theories of some Islamist logic experts such as Imam Fakhr Razi [17]. Therefore, it is

suggested that the whole procedure of MBCT should be developed based on Iranian- Islamic culture.

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Conflict of Interest

The authors have no conflict of interest in this article.

Authors' Contribution

The study was designed by JY and MM. Data was collected and analyzed by MM and AB. Moreover interventional sessions were supervised by JY.

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