Mindfulness-based Cognitive Therapy (MBCT) Reduces Depression and Anxiety Induced by Real Stressful Setting in Non-clinical Population

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ABSTRACT

A randomized, controlled study was conducted in a non-clinical population to investigate the impact of mindfulness-based cognitive therapy (MBCT) on depression, anxiety, automatic thoughts, and dysfunctional attitudes, normally induced by exam as a real stressful setting. The participants were randomly assigned either to receive 8 weekly 2.5-hour MBCT or remain in a waiting list control group. A series of two-way ANOVA with repeated measures were performed to detect if the application of MBCT would result in a systematic reduction in the dependent variables over five assessment points: pre-test, session 4, session 8, first follow-up (1 month) and second follow-up (6 months). The results indicated that MBCT was effective at helping participants to deal with their anxiety and depressive feelings before, during and after stressful circumstances. In addition, the reductions in negative automatic thoughts and dysfunctional attitudes in those who received MBCT were significant. The findings provide further evidence that MBCT might be a useful intervention for enhancing well-being in non-clinical populations who are susceptible to experience anxiety and depression in real life situations.
Key words: mindfulness, cognitive behaviour therapy, automatic thought, dysfunctional attitude.

RESUMEN

Se realizó un estudio aleatorio controlado en una población no-clínica para analizar el impacto de la terapia cognitiva basada en *mindfulness* (TCBPC) sobre la depresión, la ansiedad, los pensamientos automáticos y las actitudes disfuncionales, inducidas por situaciones de examen en contextos universitarios. Los participantes fueron asignados al azar para recibir 8 sesiones semanales de 2.5 horas de TCBPC o permanecer en lista de espera como grupo control. Se utilizó un análisis de varianza de medidas repetidas para ver si la aplicación de la TCBPC causa la reducción sistemática de las variables dependientes a lo largo de cinco mediciones: pre-test, sesión 4, sesión 8, primer seguimiento (1 mes) y segundo seguimiento (6 meses). Los resultados indicaron que la TCBPC resultó efectiva para manejar la ansiedad y los sentimientos depresivos antes, durante y después de las situaciones estresantes. Además, la reducción en los pensamientos automáticos y las actitudes disfuncionales fueron significativas entre los participantes que recibieron TCBPC. Los resultados aportan evidencia adicional en el sentido de que la TCBPC puede ser una intervención útil para mejorar el bienestar en poblaciones no-clínicas susceptibles de experimentar ansiedad y depresión en situaciones de la vida real.
Palabras clave: *mindfulness*, terapia cognitivo-conductual, pensamientos automáticos, actitud disfuncional.

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Beck's innovative cognitive model (Beck, 1967, 1976; Beck, Rush, Shaw, & Emery, 1979) produced broad applications and has made considerable clinical achievements (e.g. see HolIon, Shelton, & Loosen, 1991). This clinically-driven model has faced, however, a number of internal problems arising mostly from its isolation from basic cognitive science as well as its linear nature (see Teasdale, 1997). To overcome the difficulties, Teasdale and Barnard (1993) proposed a non-linear/multilayer model rooted in experimental cognitive psychology and cognitive science. This science-driven model recognizes two qualitatively different kinds of meaning, a specific level and a more generic level. In this conceptual framework, these two kinds of meanings are processed and represented at two different cognitive levels called propositional and implicational levels respectively (also see Teasdale 1997). Cognitive representation in the clinically-driven model will probably be well explained by the concept propositional level, at which specific meanings behind constructs (words) account for emotion production. Conversely, Teasdale (1993) explained that only the meanings processed at implicational level can elicit emotion. That is, unlike lower level specific meanings, high level generic, holistic meanings simply cannot be communicated by single language constructs. In fact, the early cognitive model recognizes only one level of meaning, and consequently has difficulties with the qualitative distinction between 'intellectual' belief (related to propositional level) and 'emotional' belief (related to implicational level), or, more generally, between 'cold' and 'hot' cognition respectively (Teasdale, 1997). He regards working on 'emotional' beliefs and facilitating 'hot' cognition as functionally crucial for emotional processing and problem resolution in therapy.

In addition, in the theoretical framework which Teasdale and Barnard (1993) proposed, the autonomic and physiological components (including bodily sensations) of emotional responses are processed within the implicational level. For this reason, a use and need for incorporating other therapeutic procedures and interventions, such as guided imagery, primarily targeted on sensory elements including physical exercise, manipulations of facial expression or music, were suggested. There seems to have been this reason, among others, that Teasdale and colleagues (see Segal, Williams, and Teasdale, 2002) approached mindfulness-based stress reduction (MBSR) developed by Kabat-Zinn (1990) and tried to incorporate its elements (such as mindfulness of breathing, sitting meditation, walking meditation, body scanning, yoga) to CBT techniques in a new framework called mindfulness-based cognitive behaviour therapy (MBCT).

Mindfulness is traditionally rooted in Eastern culture and can be characterized as a non-judgmental attention in a certain way; namely, on purpose and in the present moment (Kabat-Zinn, 1990). Mindfulness-based cognitive therapy (MBCT) is a manualized group skills training program (Segal *et al*., 2002) consisting of 8 weekly sessions of approximately 2.5 hours duration. It integrates elements of cognitive-behavioral therapy (CBT) for depression (Beck, Rush, Shaw, & Emery, 1979) into the mindfulness-based stress reduction (MBSR) training program developed by Kabat-Zinn (1990). In MBCT, however, there is little emphasis on changing the content of thoughts. Throughout this training program, in fact, people learn to recognize that thoughts and feelings are events in the mind and not self-evident truths or aspects of the self. In other words, the systematic training in MBCT facilitates "decentred" views (i.e., "Thoughts are not

facts" or "I am not my thoughts") on cognitions and feelings. It means that mindfulness helps trainees to "turn towards" cognitive experiences instead of avoiding them without "getting lost" in ruminations, worries, and negative thoughts (Segal *et al*., 2002). In MBCT, people receive extensive practice based on mindfulness meditations to bring their attention back to the present. In other words, MBCT groups teach trainees to recognize and disengage from depressogenic modes of mind and to access a new healthier mode of mind characterized by "acceptance" and "being". Turning awareness towards the present moment and all its qualities, mindfulness meditations can result in a vivid contact with the "richness" every moment holds, which is, per se, a pivotal resource for enhancing well-being (Brown & Ryan, 2003).

MBCT initially was developed to prevent relapse in people diagnosed with recurrent major depression (Segal *et al*., 2002), after promising trials (e.g., Teasdale, Segal, Williams, Ridgeway, Soulsby, & Lau, 2000). This, furthermore, benefited from a model of cognitive vulnerability to depressive relapse (Segal, Williams, Teasdale, & Gemar, 1996; Teasdale, Segal, & Williams, 1995; Teasdale, 1988). Comparing recovered patients with recurrent depression receiving treatment as usual (TAU) with a group receiving TAU plus MBCT in a randomized design, Teasdale *et al*. (2000) found that MBCT significantly reduced the risk of relapse. A similar finding was replicated in a study by Ma and Teasdale (2004). In general, reduction in relapse rates proved to be by more than 50% which is encouraging. Cognitively speaking, vulnerability to relapse of depression arises from the vicious cycle between depressed mood and patterns of negative, self-defeating, automatic thinking. A recent study has shown that MBCT seems to be an effective maintenance therapy with antidepressants in reducing relapse over a 15-months follow-up (Kuyken, Byford, Taylor, Watkins, Holden, White, Barrett, Byng, Evans, Mullan, & Teasdale, 2008). Moreover, it has been also shown that MBCT is effective at reducing excessive worry or anxiety symptoms (Roemer & Orsillo, 2007), relieving insomnia symptoms by reducing worry associated sleep problems in patients with anxiety disorder (Yook, Lee, Ryu, *et al*., 2008) and improving quality of life in the physical and psychological domains (Kuyken *et al*., 2008).

University students, throughout their study, experience anxiety and dysphoria mostly related to exam (Reff, Robert, Kwon, & Campbell, 2005; Amini & Farhadi, 2000). This, in turn, can result in lower test scores and under-achievement (Chen, 2009). It should be noted that anxiety management programs (Crockford, Holt-Seitz, & Adams, 2004; Kaviani, Pournaseh, & Sayyadlu, 2007) and cognitive behaviour techniques (Dundas, Wormnes, & Hauge, 2009) have been successful in relieving exam anxiety. Therefore, the rationale for the present trial was as follows. Exam may be regarded as a natural condition to induce aversive feelings such as anxiety and depression. In this way, a situation can be methodologically created in which we will be able to test our hypotheses in a non-clinical population. Moreover, as data concerning the application of MBCT in different cultural settings are lacking, the present study will allow us to see the effects of MBCT in a new, different cultural setting. Long history of mindfulness tradition and practice in Eastern cultures might result in this impression that people from Asia/Eastern societies would more culturally prepared to approach and enjoy the MBCT trainings compared to others. This will be further explained in discussion section.

Employing an experimental, randomized-controlled design in a real field, we conducted a study to seek evidence whether MBCT is effective in reducing anxiety and depression naturally experienced before, during and after exam among students in non-clinical population. Using 8-session group based MBCT, we will report the results of a study conducted in a non-clinical Iranian population. We hypothesized that participants in the MBCT group would show significant decreases in depression and anxiety levels, while no such changes were expected in the control waiting list group. The current research may add to the knowledge about the effectiveness and generalizability of MBCT to real-life setting.

Method

Participants

Forty-five female students were randomly selected from a list of the dormitories of Esfahan University, Iran, in a simple randomized manner. We included undergraduate students from different departments except psychology, and from second and third academic levels. The participants, then, were randomly allocated either to receive MBCT (*n*= 20, *mean age*= 20.5) or to remain on a waiting list (*n*= 25, *mean age*= 20.7). Randomization of the participants was by a statistician, who was blind to research procedure. Three in MBCT group (BDI= 15.5 and BAI= 16.9) and 6 in control group (BDI= 15.7 and BAI= 17.4) missed at least one of assessment points. Data from the remaining participants were analyzed. None of the participants had a history of neurological or mental disorders including depression and anxiety, as self-reported. Written informed consent was obtained individually after providing participants with a full description of the study.

Instruments

The Beck Depression Inventory (BDI) (Beck & Steer, 1988). BDI is a widely used 21-item self-report measure of severity of affective, cognitive, behavioral, and somatic symptoms of depression with higher scores indicating greater severity ranging from 0 to 63. Internal consistency, validity, and test-retest reliability of BDI are high in psychiatric and nonpsychiatric samples (Beck, Steer, & Garbin, 1988). The Farsi version of this measure has been tested in an Iranian population and has proved to have significant reliability (0.77), validity (.70) and high internal consistency (0.91) (Kaviani, Seifourian, Sharifi, & Ebrahimkhani, 2009).

Beck Anxiety Inventory (BAI) (Beck & Steer, 1990). BAI is a self-report instrument consisting of 21 items which are rated on a 4-point scale ranging from 0 ("not at all") to 3 ("severely, I could barely stand it"). The summed score of all items on the BAI (ranging from 0- 63) taps the severity of anxiety symptoms. The Farsi version of BAI proved to be a significantly reliable (0.83) and valid (0.72) instrument with high internal consistency (0.93) (Kaviani & Mousavi, 2008).

Dysfunctional Attitudes Scale (DAS). DAS has been designed to measure long lasting depressogenic schemata (Beck, Rush, Shaw, & Emery,1979; Weissman, 1979). This 40-item measure is a frequently cited cognitive tool in studies on depression, and has been used to assess treatment outcome (Dozois, Covin, & Brinker, 2003). Psychometric

properties of DAS have been outstanding (e.g., see Nezu, Meadows, & McClure, 2000). Prior to this main study, validity and reliability of Farsi version of DAS were examined in a pilot study carried out by researchers. Sixty five participants completed DAS, ATQ and BDI. The correlations between DAS and BDI (0.65) and between DAS and ATQ (0.78) were regarded as indices of convergent validity. They were retested after one month. The results showed a significant test-retest reliability quotient (0.76) for DAS.

Automatic Thoughts Questionnaire-Negative (ATQ-N) (Hollon & Kendall, 1980). ATQ-N is a 30-item measure designed to assess the frequency of negative automatic thoughts. Each item is scored from 1 (not at all) to 5 (all the time), with higher scores indicative of more frequent negative thoughts. Psychometric properties of this measure are satisfactory. As described in the previous sub-section, correlations between ATQ and DAS (0.78) and between ATQ and BDI (0.68) were regarded as convergent validity quotients. Test-retest reliability for ATQ was obtained 0.76.

Procedure

A statistician colleague, who was blind to the treatment interventions, was given access to the list of the students living in the dormitories. She then randomly allocated a randomized number of potential participants to two groups. They were approached by therapist individually and face to face, describing the study aims and procedures, probing exclusion and inclusion criteria, and inviting them to participate. If eligible and willing, they signed a formal informed consent form. MBCT (based on Segal *et al*., 2002) were run by the therapist in 8 consecutive 2.5-hr sessions. All assessments were conducted at the beginning of the first, forth, and eighth sessions, and also one month (first follow-up) and six months (second follow-up) after the last session. The group-based MBCT training was planned to start 2.5 months before the first date of final exam so the first follow-up assessment was during exam time. The exam period takes usually three weeks and all participants were engaged in sitting exams during this time period. Assessments for control group were carried out in parallel time points.

The treatment protocol followed the MBCT group-based program designed to help participants to learn skills that prevent depressive relapse/recurrence (Segal, Williams, & Teasdale, 2002). Following an induction session, 8 weekly 2.5 hour group sessions were delivered by a psychologist who was trained in MBCT program.

Following the initial 8-week phase, two follow-up sessions were scheduled at intervals of 1 and 6 months afterwards. MBCT sessions were audio-taped, with participants' permission, for monitoring of treatment integrity and therapist competence. Using a relative check-list, the recordings then were reviewed by a clinical psychologist to check for precision and integrity of the method implemented. Session therapeutic materials included: guided mindfulness practices (i.e., body scan, sitting meditation, walking meditation, mindful breathing and yoga); encouraging participants to share their experience of these practices; review of weekly homework (i.e., 40 min of mindfulness practice per day and generalization of session learning in meetings intervals); and teaching cognitive-behavioral skills (e.g., recording pleasant/unpleasant events, observing stream of thoughts, recognizing automatic thoughts, new relationship with thoughts; for more details see Segal *et al*., 2002). The Farsi versions of homework CDs (i.e., body scan, meditations and Yoga) (Bahadoran & Pournaseh, 2005) were used. There was a

checklist which was used to monitor participants' homework activities, time spent for every single task, and problems faced during conducting them. Although the monitoring inputs seemed satisfactory, feedbacks were given if any underachievement was observed.

Data analysis

A series of two-way [2 (Groups: control and experimental) × 5 (Sessions:1st, 4th, 8th, 1st follow-up and 2nd follow-up)] ANOVA with repeated measures was conducted on dependent variables (Scores: BDI, BAI, DAS, ATQ) separately, with Group as a between-subject and Session as a within-subject variables. If there was any interaction effect, therefore we would exclude the group factor and run the analysis for each group alone followed by polynomial test to detect possible linear trend. All analyses were undertaken using SPSS version 15.

RESULTS

Figures 1 and 2 show separately the mean changes on BDI and BAI in two groups over five assessment points. The statistical analysis on BDI scores revealed an interaction effect between Group and Session variables ($F_{4, 136}= 5.50$, $p <0.01$) and a significant main effect for Session ($F_{4, 136}= 10.46$, $p <0.01$). Excluding Group variable, the analysis only showed a statistically significant difference between sessions only in the experimental group ($F_{4, 64}= 5.60$, $p <0.01$) showing a linear trend ($F_{1, 16}= 12,70$, $p <0.01$), that is, depression level reduced over treatment and follow-up sessions. The same analysis on BAI revealed an interaction effect ($F_{4, 136}= 4.09$, $p <0.01$). No main effect of Session was obtained. Supplementary analysis for each group showed a reduction on
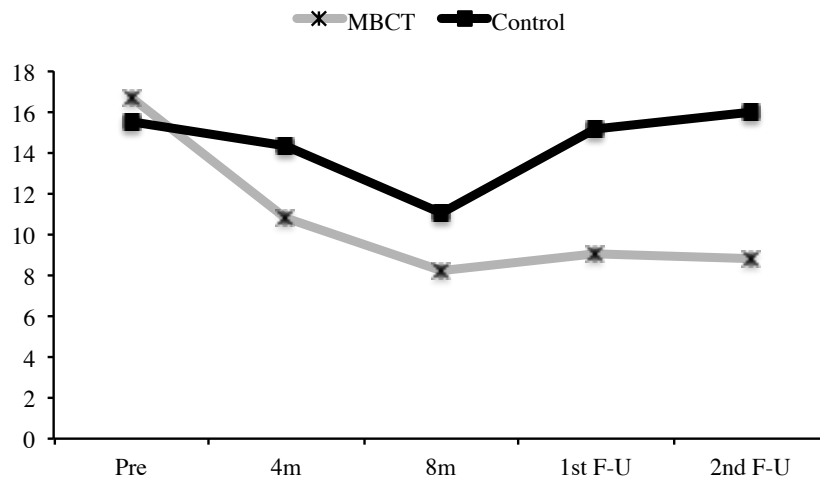

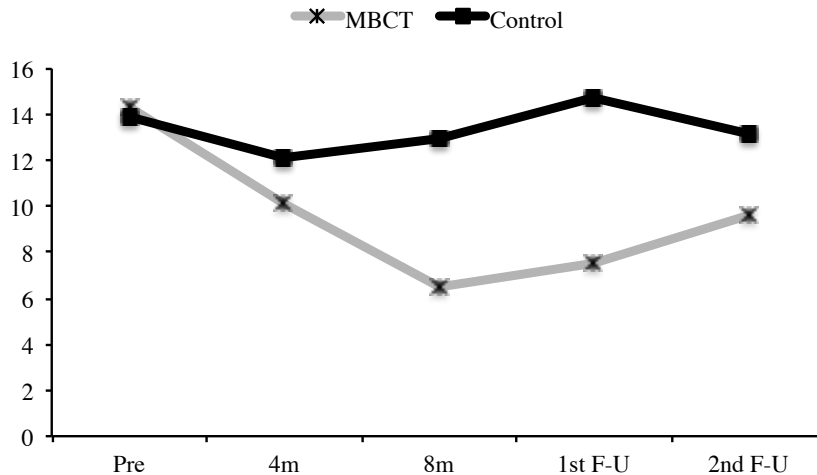*Figure 1*. BDI mean changes in two groups over five assessment points.

Figure 2. BAI mean changes in two groups over five assessment points.

anxiety over time only in the experimental group ($F_{4, 64}$= 5.60, p <0.01) with a significant linear trend ($F_{1, 16}$= 9.65, p <0.01).

Figures 3 and 4 depict mean changes on DAS and ATQ in two groups over five assessment points. However, a significant interaction effect ($F_{4, 136}$= 8.23, p <0.01) was found for DAS scores with supplementary analysis showing a statistically significant difference between DAS scores over sessions in the experimental group ($F_{4, 64}$= 8.31, p <0.01) showing a linear trend ($F_{1, 16}$=15.75, p <0.01). No main effect of Session was found for DAS. Furthermore, significant Group × Session interaction ($F_{4, 136}$= 3.44, p <0.01) and main Session ($F_{4, 136}$= 2.78, p <0.05) effects were obtained for the data on
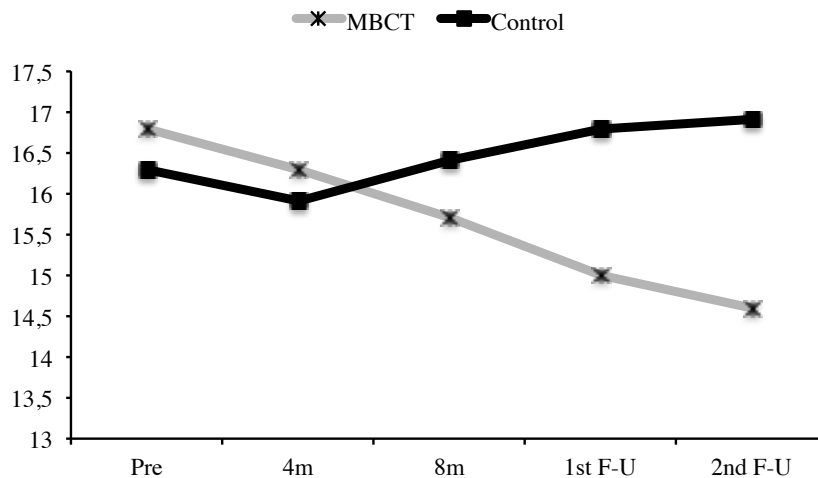

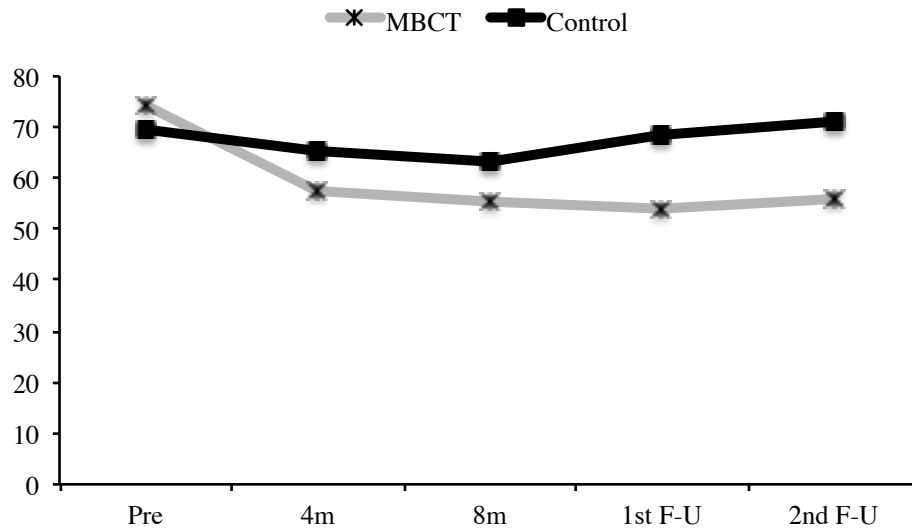*Figure 3*. DAS mean changes in two groups over five assessment points.

Figure 4. ATQ mean frequencies in two groups over five assessment points.

ATQ. Again supplementary analysis showed a gradual decline on ATQ scores in the experimental group ($F_{4, 64}= 7.13$, $p < 0.01$) with a significant linear trend ($F_{1, 16}= 14.31$, $p < 0.01$). Both dysfunctional attitudes and automatic thoughts have been reduced over the treatment and follow-up sessions.

DISCUSSION

In a different cultural setting, we used an experimental, randomized-controlled design to examine the impact of potential group-based MBCT (Segal *et al.*, 2002) to reduce anxiety and depression, naturally reported by students before, during and after university exams (Reff, Robert, Kwon, & Campbell, 2005; Amini & Farhadi, 2000). The design allowed us to test plausibility and feasibility of this therapeutic method in a non-clinical sample. The findings of this preliminary study showed that the application of MBCT resulted in a systematic reduction in the scores of BDI, BAI, ATQ and DAS over five assessment points, namely, pre-test, session 4, session 8, one month and 6 months follow up. The results support the assumption that MBCT techniques and exercises help students not to experience high levels of anxiety, depression, negative automatic thoughts and dysfunctional attitudes during exams period.

To date, there are methodologically sound experiments showing clinical efficiency of MBCT to reduce relapse and recurrence in depression (Teasdale *et al.*, 2000; Ma & Teasdale, 2004; Kuyken *et al.*, 2008). In line with these research, the present results shows that normal people also can benefit from MBCT trainings to combat anxiety and depression that they experience before, during and after natural, stressful situations (e.g.

exams, competitions, presentations and the like). Anxiety tends to be a reaction to threat, unforeseen results, or fear of failure (and has a tendency to be future-oriented), whilst depression tends to be a reflection of loss or failure (and has a tendency to be past-oriented). Students are a vulnerable population to be affected by anxiety and depressive symptoms due to inevitable stressors like exam (Reff, Robert, Kwon, & Campbell, 2005). Cognitively speaking, these are the worries, ruminations, negative thoughts, and catastrophizing images that prepare the ground for development of anxiety and depression which in turn aggravates these dysfunctional cognitions and pushes individual to "get lost" in more ruminative, self-perpetuating patterns of thoughts and images. This then keeps the vicious cycle revolving. MBCT teaches people to become more aware of, and to relate differently to their thoughts, feelings, and bodily sensations. In fact, mindfulness training is also used to support recognizing and disengaging from negative modes of mind. For example, people are encouraged to connect with their thoughts and feelings as passing events in the mind, rather than to identify with them as accurate representations of reality. These are the skills learned from MBCT that, in fact, help individuals disengage themselves from habitual dysfunctional cognitive routines, which in turn protect them against future risk of experiencing anxiety and depression. For example, using a focus on the breath as an anchor helps revert attention from diversion to streams of thoughts, worries, or general lack of awareness.

Furthermore, research findings on the impact of regular meditation practice produce positive lasting effects on attention, executive functioning (Lutz, Slagter, Dunne, & Davidson, 2008; Slagter, Lutz, Greischar, *et al.,* 2007; Tang, Ma, Wang, *et al.,* 2007) and emotion regulation (Nielsen & Kaszniak, 2006). These cognitive functions which can be achieved through mindfulness meditation training may reinforce the trainee cognitive control to overcome habitual and automatic character of rumination.

One advantage of MBCT and meditation trainings is the cultural affinity between the techniques we used and cultural background of the trainees. Mindfulness practice is a historically long tradition amongst most Eastern cultures. It means that people in Asian/Eastern societies are already familiar with concepts such as "acceptance", "being", "mindfulness meditations", "richness in every moment", and "compliance". Keeping these points in mind, one might conclude that people with Asian/Eastern cultural background would more contentedly approach and enjoy the MBCT trainings compared to others. It is a crucial hypothesis that its confirmation requires empirical investigations in future.

It should be noted that the findings of our study must be interpreted with caution and in the context of certain limitations to the conclusions that may be drawn from the present study. First, we confined the sample to female participants as it was more convenient and feasible for our female therapists to deliver MBCT trainings inside female student dormitories bearing in mind the cultural restrictions. This may limit the generalizability of our results. For this reason, it seems important to establish the replicability of the present findings. Therefore, future research should address this limitation and examine the effectiveness of MBCT across the gender variable. Also due to lack of a mindfulness measure in this study, one might shed a light on this possibility that perhaps some other construct has been targeted during trainings rather than mindfulness. Moreover, another limitation of the present study is the lack of another intervention group. So doing allows

us to tap the possible effects of the non-specific factors, such as supportive nature of group-gathering, therapeutic rapport and alliance, receiving empathy and sympathy, sharing views, time passing etc. Other potential factors which potentially influence the dependent variables including repeated data collection and experimenter's demand should also be taken into consideration. Future research need to be designed to assess these shortfalls and attribute properly the effects of MBCT to its specific components rather than to non-specific factors, and also to control for potential factors affecting the outcome measures. In addition to these limitations, the lack of a measure to assess academic achievements during the exam period deserves mention.

Despite these shortcomings we are encouraged that the intervention improved quality of well-being. However, the limitations of the current effectiveness evidence should be used to shape the direction of future research. We admit that it will take a great deal of precise empirical investigations to pinpoint the specific effects of MBCT in both clinical and normal settings.

In this study, we trained non-clinical, normal participants in order to test this assumption that MBCT group-based training could help people to combat effectively high levels of anxiety and depression experienced when undergoing stressful situations (in this case, university exam). To complete this picture, we also need to detect the effects of this therapeutic method in a sub-clinically depressed sample; among people who are not diagnosed as clinically depressed but score above cut-off point in depression measurements such as BDI. This would help us to answer a question of interest: Does MBCT, when offered to a sub-clinically depressed population, prepare them to be resistant against future anxiety and depressive symptoms which usually happens during stressful situations?

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