



Effect of a Mindfulness-Based Intervention Program on Comprehensive Mental Health Problems of Chinese Undergraduates

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Abstract

How best to support mental health of young people is an important public health challenge. More empirical researches are needed to examine the relationship between mindfulness-based interventions and mental health in China. The present study reports results from a quasi-experiment following a one-group repeated-measures design which investigated the impact of a standard 8-week mindfulness-based cognitive therapy (MBCT) program in 81 Chinese undergraduates (14 males, 67 females, age 20.35 ± 1.35 years). Data was collected using the Symptom Check List 90 (SCL90) at baseline, week 3, week 6 and week 8 in order to examine the trajectory of mental health changes during the MBCT training. The repeated measures analysis of variance showed that the decrease was significant in the scores of somatization ($F = 13.432$, $P < 0.01$), obsessive–compulsive symptoms ($F = 43.954$, $P < 0.01$), interpersonal sensitivity ($F = 36.196$, $P < 0.01$), depression ($F = 25.914$, $P < 0.01$), anxiety ($F = 26.547$, $P < 0.01$), hostility ($F = 19.707$, $P < 0.01$), phobic anxiety ($F = 21.145$, $P < 0.01$), paranoid ideation ($F = 19.857$, $P < 0.01$) and psychoticism ($F = 32.833$, $P < 0.01$). The findings from the present study show that a standard MBCT program may have positive impact on reduction in mental health problems in Chinese undergraduates. Further controlled studies with randomized designs are needed to investigate these promising results in more depth.

Keywords Mindfulness · Mindfulness-based intervention · Mindfulness-based cognitive therapy · Mental health · Undergraduate

Introduction

Nowadays, mental health problems have been ranked in the second of the global burden of disease (GBD) tables overall, accounting for 11.23% of the GBD. The year lived with disability (YLD) estimation of mental health related burden is 32.42% which represents a significant burden of disability and is projected to continue to rise (Vigo et al. 2016). With mental health problems worldwide being highlighted, the theoretical and empirical interest is growing rapidly in the exploration of mindfulness as a psychotherapy which may reduce mental health problems (Keng et al. 2011).

Mindfulness could be defined as the ability to observe all phenomena (thoughts, emotions and sensations) in the present moment with an open and accepting orientation toward one's experiences with nonjudgmentally (Spijkerman et al. 2016; Bishop et al. 2004; Le and Trieu 2014). As a method of psychotherapy for clinical problems, mindfulness was applied initially in treating chronic pain patients by Kabat-Zinn in the 1970s (Kabat-Zinn 1982). Since then, several mindfulness-based interventions (MBIs) have been developed and are increasingly attracting researchers' interest in the field of mental health care, such as mindfulness-based stress reduction (MBSR) (Kabat-Zinn 1990), Dialectical Behaviour Therapy (DBT) (Linehan 1993), mindfulness-based cognitive therapy (MBCT) (Segal et al. 2002), Acceptance and Commitment Therapy (ACT) (Hayes et al. 2006), and so on. As evidenced by a substantial number of systematic reviews, mindfulness is positively related with many aspects of mental health, such as higher levels of adaptive emotion regulation, vitality, positive affects and life satisfaction, and lower levels of psychopathological symptoms

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and negative affects in a broad range of populations (Keng et al. 2011; Galante et al. 2012; Rempel 2012; Rawlett and Scrandis 2016; Spijkerman et al. 2016).

MBIs have been termed the “third wave” approaches of psychotherapies in the Western World (Hayes et al. 2004). As an important path of practice of Zen Buddhism and Taoism, Mindfulness has deep roots in China and could be traced back to more than 2500 years ago. In the past 5 years, the possible efficacy of mindfulness training on mental health problems has received increasing attention in China. There were only 26 relevant literatures by searches of China National Knowledge Infrastructure (CNKI, the China’s largest and most authoritative academic resources database) to December 2010, and the number was up to 552 by August 2018 (Ji et al. 2018; Chen et al. 2018). However, the research in this field in China is still at the initial stage, more empirical researches are need to support it. The present study aimed to examine whether MBCT would be associated with reductions in comprehensive mental health problems in Chinese undergraduates.

Methods

Participants

Convenience sampling was employed in the present study. Participants included undergraduates who were enrolled by advertisement in Hengyang Normal University. The university with a student population of 21,000 is a typical ordinary regional normal university in China, and locates at Mount Hengshan in central south of China. As a famous of Buddhist, Taoist and Confucianism resort, this district has a tradition of Chinese meditation. The present study was supported greatly by the university because it encourages and facilitates Chinese traditional culture. Prospective participants attended an orientation session prior to the beginning of the MBCT program during which they received detailed information about the program format and requirements and signed informed consent. Every formal participant was paid ¥20 for each MBCT program session training. All procedures performed were in accordance with the ethical standards of the local institutional research ethics committee and with the 1964 Helsinki Declaration and its later amendments. Human subject approval was granted by the Human Studies Program/IRB of the Hengyang Normal University.

The final sample of participants included in the analyses met the following inclusive criteria: (1) took part in every MBCT training course; (2) practiced mindfulness according to the MBCT instructions outside of the formal MBCT sessions (home practice) at least once a day, 6 days a week, 30 min at a time; (3) completed all the mental health

assessments in the required time frame and without excessive missing data.

Mindfulness-Based Intervention Program

Mindfulness-based cognitive therapy (MBCT) was implemented as the intervention in the present study. MBCT is a group-based 8-week mindfulness program (Segal et al. 2002). It includes sitting meditation, movement meditation (e.g. yoga) and silent meditation, it is more similar to Zen Buddhism and Taoism of China. The training materials of MBCT were translated into Chinese by Huiqi Tong, an expert of MBCT who was fluent in both Chinese and English. The Chinese version of MBCT training materials have been used in the MBCT teacher training of the Oxford Mindfulness Centre (OMC) in China.

The MBCT training program was implemented from April to June 2016. It followed the protocol which consisted of eight weekly courses lasting 2.5 h each and was run in one-group format, each training course included guided mindfulness, discussion and experiential exercises (Segal et al. 2002). In addition to the weekly group-based training courses, participants should finish daily homework practices (30–60 min daily, at least 6 days/week) guided by the audio files of meditations. Participants were also encouraged to integrate mindfulness into their everyday activities. Training courses were provided by the author who have been practiced meditation for 18 years and have received MBCT training of the Oxford Mindfulness Centre and California Institute of Health since 2014.

Mental Health Assessment

The present study utilized the Symptom Check List 90 (SCL90, Derogatis 2000) to assess participants’ mental health. The SCL90 was composed with 90 items and nine subscales including Somatization, Depression, Obsessive–Compulsive, Interpersonal Sensitivity, Hostility, Anxiety, Paranoid Ideation, Phobic Anxiety and Psychoticism (Derogatis 2000). Every item is scored on a five-point Likert scale, indicating the rate of occurrence of the symptom in the latest week. The SCL90 normally requires 12–20 min to complete (Derogatis 2000). The Chinese version of SCL90 has good psychometric properties (Wang 1984; Jin et al. 1986).

The assessments were completed four times during the MBCT program. Baseline assessment (T1) was completed immediately prior to the orientation sessions, the second assessment (T2) was held on Saturday of the third week before the new MBCT training course, the third (T3) was held on Saturday of the sixth week before an all-day session, and the fourth (T4) was completed on Saturday of the eighth week when the whole program was finished.

Statistical Analysis

The repeated measures analysis of variance (rANOVA) was implemented. The Mauchly test was used to assess the homogeneity of error variances in order that the results of rANOVA would be interpreted validly. The Greenhouse–Geisser correction would be employed to control the homogeneity of error variances if the results of Mauchly test were significant. The sources of the significant interaction effects were identified with the post hoc pairwise comparisons when significant interactions occurred. All data analyses were conducted using SPSS statistical software version 21 (SPSS Inc., Chicago, IL, USA).

Results

Participant Demographics

Originally, 100 undergraduates (24 males, 76 females) were recruited and completed the baseline assessment. 89 participants attended all the eight weekly sessions of MBCT program. 86 participants completed all assessments at the four time points, but finally, only 81 participants met the inclusive criteria. The 81 participants included 14 males and 67 females, the mean age was 20.35 (SD = 1.35 years; range 18–23).

Statistical Analysis of the Results of Mental Health Assessments

Descriptive statistical analysis of the data from SCL90 assessments conducted during the MBCT program at the four time points was calculated first. The results indicated that all of the mean group scores of SCL90 subscales showed reductions. But the exact pattern of the reductions was not uniform, for most of the subscales, the scores decreased from T1 to T2, and then decreased further from T2 to T3, but the amplitude reduction became smaller, finally reduced steeply from T3 to T4. The results are summarized in Table 1 and depicted in Fig. 1.

The inferential statistics results from rANOVAs were examined next. The Greenhouse–Geisser corrections were implemented because the assumptions of homogeneity of variance were not satisfied by the Mauchly test. The results revealed significant main effects of time for all the nine SCL90 subscale scores and the total average score ($P < 0.01$). See Table 1.

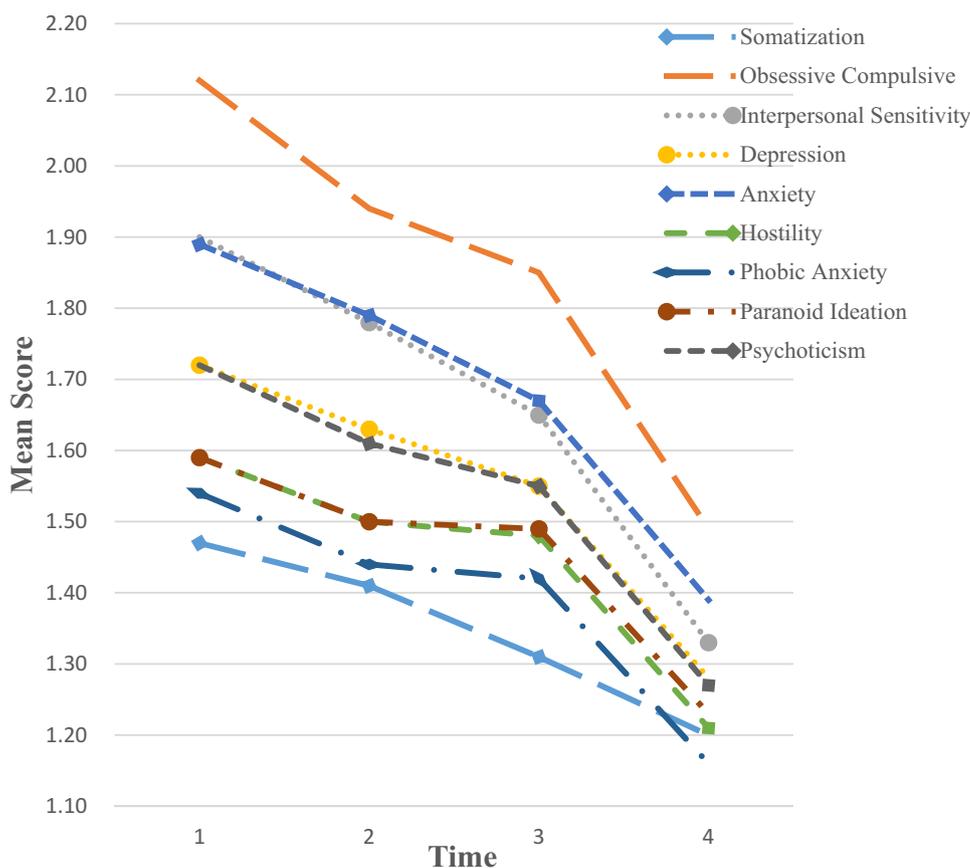
However, there were pre-post test differences across the SCL90 subscales. Post-hoc pairwise comparisons addressed these differences. (1) As for the Total Average Score and Interpersonal Sensitivity, the scores of the later tests were significantly lower than those of the previous tests. (2) As for Somatization, Depression and Anxiety, T4 score was significantly lower than T3 score, and T3 score was significantly

Table 1 Statistical analysis of the results of SCL90 assessments (M ± SD)

SCL90 subscale	T1 Baseline test	T2 2th post-test	T3 3th post-test	T4 4th post-test
Total average score	1.73 ± 0.52 F = 38.177**	1.63 ± 0.54	1.55 ± 0.50 T1 > T2 > T3 > T4	1.29 ± 0.27
Somatization	1.47 ± 0.51 F = 13.432**	1.41 ± 0.45	1.31 ± 0.37 T1T2 > T3 > T4	1.20 ± 0.26
Obsessive–compulsive	2.12 ± 0.65 F = 43.954**	1.94 ± 0.66	1.85 ± 0.63 T1 > T2T3 > T4	1.49 ± 0.42
Interpersonal sensitivity	1.90 ± 0.65 F = 36.196**	1.78 ± 0.71	1.65 ± 0.66 T1 > T2 > T3 > T4	1.33 ± 0.36
Depression	1.72 ± 0.63 F = 25.914**	1.63 ± 0.61	1.55 ± 0.57 T1T2 > T3 > T4	1.28 ± 0.35
Anxiety	1.89 ± 0.66 F = 26.547**	1.79 ± 0.67	1.67 ± 0.63 T1T2 > T3 > T4	1.39 ± 0.34
Hostility	1.59 ± 0.50 F = 19.707**	1.50 ± 0.51	1.48 ± 0.57 T1 > T2T3 > T4	1.21 ± 0.26
Phobic anxiety	1.54 ± 0.56 F = 21.145**	1.44 ± 0.56	1.42 ± 0.58 T1 > T2T3 > T4	1.16 ± 0.24
Paranoid ideation	1.59 ± 0.54 F = 19.857**	1.50 ± 0.51	1.49 ± 0.55 T1T2T3 > T4, T1 > T3	1.23 ± 0.33
Psychoticism	1.72 ± 0.56 F = 32.833**	1.61 ± 0.59	1.55 ± 0.55 T1 > T2T3 > T4	1.27 ± 0.29

**P < 0.01

Fig. 1 Score curves of SCL90 subscales at the four time points during the MBCT program



lower than scores at T2 and T1, but T2 score was not significantly different with T1 score. (3) As for Obsessive–Compulsive, Hostility, Phobic Anxiety and Psychoticism, T4 scores were significantly lower than the scores at T3 and T2, the scores at T3 and T2 were significantly lower than T1 scores, but the differences between T3 and T2 scores was not significant. (4) As for Paranoid Ideation, T4 score was significantly lower than the scores at T1, T2 and T3, T3 score was significantly lower than T1 score, while there was not significant difference between T1 score and T2 score, as well as T2 score versus T3 score and T3 score versus T4 score. See Table 1.

Discussion

The present study proposes that because mindfulness has deep historical root in Chinese traditional culture (e.g. Zen Buddhism, Taoism), it has been widely and easily accepted by Chinese, with beneficial outcomes for participants (Guo 2002). Indeed, increasingly more Chinese practice mindfulness as an approach as part of their health regimen (Wang 2015). Interestingly, MBIs in clinical psychology were derived from the surge of Zen Buddhism in the West in 1960s, and now are coming back to the East as a new

modern mainstream and secular way of prevention and intervention for mental health problems.

The present study aimed basically to assess the efficacy of MBIs on mental health problems among a nonclinical sample of undergraduates. A standard 8-week MBCT protocol was implemented in the MBI program. The intervention led to decreases of mental health problems in undergraduates. As the results revealed, the 8-week MBCT training produced significant universal reductions in the nine types of mental health problems assessed by SCL90. These findings are consistent with previous systematic reviews which indicate that MBIs could improve mental health effectively in non-clinical populations with a range of psychological and clinical conditions (Keng et al. 2011), such as bipolar disorder (Miklowitz et al. 2009), psychosis (Chadwick et al. 2005), eating disorders (Baer et al. 2005), substance use problems (Witkiewitz et al. 2005; Bowen et al. 2006), attention deficit hyperactivity disorder (Zylowska et al. 2008), generalized anxiety disorder (Roemer et al. 2008), panic disorder (Kim et al. 2010), and so on.

As for MBCT, it was initially developed to prevent relapse or recurrence of major depressive disorder (MDD), aiming primarily to change patients' awareness of and relationship to thoughts and emotions (Keng et al. 2011; Teasdale et al. 2000) and has been shown very good efficacy in

reducing depressive symptoms (Keng et al. 2011; Hepburn et al. 2009; Barnhofer et al. 2009). MBCT is now being studied to treat a variety of mental health problems similarly to other MBI programs (Spijkerman et al. 2016; Keng et al. 2011; Galante et al. 2012). The present study provides a new empirical support to the universal effect of MBCT on mental health problems. The results also suggest that a universal MBI program such as MBCT is feasible and acceptable given the small dropout rates in this study and high completion rates of all the sessions. A universal MBI program can be particularly advantageous when utilized for the goal of prevention rather than treatment in a non-clinical population. For example, a universal school-based MBI program which could involve the whole students in a school may result in less labelling and stigmatization that would pull students out for a targeted program (Rempel 2012). At the same time, such a MBI program may have less pressure than clinical therapeutic methods which may need to touch painful or traumatic experiences, because a MBI program usually focuses on building psychological adaptive capacity in students rather than on treating mental health problems directly. In this way, a MBI program can benefit every student by helping them learn to manage life stressors and feel better about themselves (Rempel 2012; Coholic et al. 2009; Mendelson et al. 2010)

However, the present study revealed that there were differences in how the process of the MBCT impacted on different mental health problems even though the overall trend of these problems was towards reductions. Specifically, the reductions at the last two time points of the MBCT progression were more pronounced than at the first two time points during MBCT for all of the mental health problems which SCL90 assessed. For example, (1) the effects on obsessive–compulsive, hostility, phobic anxiety and psychoticism are significant from the third week and seldom changed in next three weeks; (2) the effects on somatization, depression, anxiety and paranoid ideation were significant until the sixth week, and then the changes were limited before the third week and after the sixth week for somatization, depression and anxiety, while the level of paranoid ideation kept on reducing further after the sixth week; (3) the effect on interpersonal sensitivity emerged at the third week assessment, and then the level of interpersonal sensitivity kept on reducing further after this timepoint. Differences in the efficacy on specific mental problems and conditions while utilizing the same MBI have also been found in previous studies (Ma and Teasdale 2004; Teasdale et al. 2000; Cordon et al. 2009; Shapiro et al. 2011). In light of this empirical evidence, some researchers have advocated that MBIs should be looked as problem formulation approaches for treating psychological condition rather than “cure-all” therapeutic techniques even though MBIs have widespread application value (Keng et al. 2011; Teasdale et al. 2003;

Kocovski et al. 2009). Furthermore, a specific MBI program should be appropriately adjusted to fit the needs of specific psychological conditions and populations in order to maximize its clinical utility and efficacy (Keng et al. 2011), that is to say, specific MBI program for specific mental health problems and specific populations may be more efficacious.

Duration of the MBI programs should be also worth highlighting here. The present study found that the significant effect of MBCT program emerged from the third week for obsessive–compulsive symptoms, interpersonal sensitivity, hostility, phobic anxiety and psychoticism, while the MBCT effect was not obvious until to the sixth week for somatization, depression and anxiety, and the effect was remarkable and stable until the end of the eighth week in all of the nine mental problems which SCL90 assesses. This suggests that for most of mental health problems, the duration of the MBI programs should not be less than 6 weeks, and 8-week duration may be more optimal. It is very reasonable that a standard model of MBCT/MBRS program runs for 8 weeks (Segal et al. 2002; Kabat-Zinn 2003)

The present study has some limitations. First, the study was conducted in a Chinese regional normal university with participants who voluntarily enrolled in a standard MBCT program. Although the sample was of representative in the same kind of university in China, such participants may differ from the undergraduates in universities of science and engineering in a number of respects, including majority of them were females at junior grades and had low levels of mental health problems at baseline. Second, due to budget limitations and ethical principle, the present study adopted one-group repeated-measures design, unspecific effects could not be controlled for in the current project, the efficacy of the MBCT program should be investigated by further in RCT studies. Third, due to graduation and internship, many participants failed to accept long-term follow-up assessments at programmed intervals, it is unclear whether the efficacy of MBCT program would be maintained over time. Nevertheless, the present interventional and longitudinal study provided essential information about the course and outcome of effect of MBCT on mental health problems.

Conclusion

In conclusion, the present study found that a standard MBCT program significantly reduced efficacy on comprehensive mental health problems in Chinese undergraduates. These encouraging findings deserve further study in larger randomized controlled trials to extend the present findings. Future research could investigate the impact on MBI programs in other healthy populations and also in clinical populations.

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Compliance with Ethical Standards

Conflict of interest The authors declare that he has no conflict of interest.

Ethical Approval All procedures followed for the present study were approved by the Ethics Committee of Hengyang Normal University and were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5).

Informed Consent Informed consent was obtained from all participants for being included in the study. No identifying information is included in this article.

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