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The Effects of Mindfulness Training on Emotional Health in Chinese Long-Term Male Prison Inmates

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Abstract

Long-term imprisonment can cause severe emotional problems, which in turn can trigger behavioral problems, self-harm, and suicide. Mindfulness-based intervention can enhance emotional health. This study investigated the effects of a 6-week mindfulness training program on the emotional health of long-term male Chinese prison inmates. Forty long-term male prisoners completed a pretest and posttest, with 19 in the mindfulness training group and 21 in the waitlist control group. The treatment group showed a significant improvement in mindfulness level, anxiety, depression, tension-anxiety, depression-dejection, anger-hostility, confusion-bewilderment, and total mood disturbance. Implications and limitations of this study were discussed. These results support the use of a mindfulness-based intervention to enhance the emotional health of long-term male prison inmates.

Keywords

Meditation; Mindfulness treatment; Emotion regulation; Inmates; Negative emotions

Introduction

Imprisonment causes severe emotional problems (Fazel and Seewald 2012). The literature has shown that prisoners displayed higher levels of distress (Iversen et al. 2014; Zamble and Porporino 1990), anxiety (Unver et al. 2013), and depression (Johnson and Zlotnick 2012). In China, about 40–59 % of the prisoners suffer from anxiety and 53–62 % from depression symptoms (Shi et al. 2007; Zheng and Zhao 2009). These issues, in turn, can contribute to serious personality disorders (Edens et al. 2015; Fazel and Danesh 2002; Warren et al. 2002), behavioral problems (Unver et al. 2013), self-harm (Maden et al. 2000), and suicide (Radeloff et al. 2014).

Compliance with Ethical Standards The study received ethical approval from the Academic Committee of the Department of Psychology, College of Education, Capital Normal University. No adverse events were reported in this study.

Conflict of Interest The authors declare that they have no conflict of interest.

Many interventions for prisoners or offenders have focused primarily on the prevention and correction of offensive behaviors to reduce the risk of criminality (Lipsey and Cullen 2007). In contrast, few studies exist that examine the prisoners' mental health (Leigh-Hunt and Perry 2015). Recent studies have shown that prisoners can, in fact, benefit from some psychological interventions, like cognitive behavioral therapy (Chen et al. 2014; Khodayarifard et al. 2010; Wen et al. 2015) and music therapy (Chen et al. 2015; Gold et al. 2014). The study by Chen et al. (2015) investigated the effects of group music therapy for Chinese prisoners and found a significant improvement in anxiety, depression, and self-esteem. However, the restricted access to music in the prison settings limits the utility of this intervention. Mindfulness meditation, on the other hand, is a potentially useful therapeutic technique that is much easier to apply in the isolated environment of a prison system.

Mindfulness-based practices, which are based on Eastern traditions, have been gaining increasing popularity worldwide as a technique for stress reduction (Hofmann et al. 2010; Kabat-Zinn 2003) as well as in combination with cognitive therapy (Segal et al. 2002). In China, the effects of these practices have received empirical support in clinical patients (Liu et al. 2011) and the general population (Xu and Liu 2013; Xu et al. 2015).

Samuelson et al. (2007) investigated the effect of mindfulness-based stress reduction (MBSR) among 1350 inmates and found a significant improvement in hostility, self-esteem, and mood disturbance. Himelstein et al. (2012b) found a significant decrease in perceived stress and a significant increase in health self-regulation after 32 young inmates completed a 10-week MBSR. Himelstein et al. (2012a) also reported beneficial effects of this intervention after a qualitative analysis of 23 incarcerated adolescents. Participants reported a substantial improvement in self-regulation and subjective well-being after participating in mindfulness training. The study by Lee et al. (2011) showed that mindfulness-based interventions can reduce the negative effect of drug use in Chinese prison populations, suggesting that mindfulness trainings may be beneficial for Chinese inmates.

Most of the studies to date lacked a control condition. One review demonstrated that only two mindfulness-based intervention studies for prisoners included a control group (Lee et al. 2011; Samuelson et al. 2007; Shonin et al. 2013). Furthermore, it is unclear whether the mindfulness-based interventions had long-term benefits. Samuelson et al.'s (2007) study was a nonrandomized waitlist controlled trial. In addition to these design limitations, it is unclear whether the same results can be found in a Chinese prison population. In addition, the participants in the study by Lee et al. (2011) consisted of Taiwanese prisoners. Therefore, the results cannot be generalized to the prison settings in mainland China.

In the present study, we examined the effects of this intervention in prisoners from mainland China. We hypothesized that (1) mindfulness training would significantly enhance the level of mindfulness in long-term male prisoners and (2) mindfulness training would significantly enhance the emotional health of prisoners by lowering anxiety, depression, and other negative emotions over the long-term.

Method

Participants

Participants were recruited during a 1-h introductory lecture held in a prison in Beijing, China. Before the introductory lecture, screening work was done by the psychological counselors in the prison, ensuring that participants did not have any serious psychological or other problems that might interfere with the study. There were 100 prisoners invited to attend the introductory lecture. Using G*Power 3.6.9.2, the number of participants required was calculated (setting partial $\eta^2 = 0.25$; $1 - \beta = 0.9$). Result showed that a total of 36 participants were needed to achieve adequate test power.

A total of 54 prisoners agreed to participate in the study. All participants were long-term male prisoners with remaining prison sentences of at least 10 years. They were imprisoned for serious criminal behaviors, such as murder, robbery, kidnapping, or drug trafficking. The average age of participants was 41.3 ($SD = 10.3$; range 22–57). Seventeen (42.5 %) participants were from urban, and 19 (47.5 %) from rural areas (with 10.0 % missing data). Eleven participants (27.5 %) were unmarried, 14 (35.0 %) were married, and 12 (30 %) were divorced (with 7.5 % missing data). Eleven of them (27.5 %) had educational levels that were at (or below) elementary school; 26 (65.0 %) were at the secondary education level, and two (5.0 %) were at the university level (with 2.5 % missing data).

Participants were randomized to the study groups with minor adjustments to comply with scheduling constraints of some prisoners. As a result, 25 of them were assigned to the mindfulness training group and 29 of them were assigned to the waitlist control group. For those in the mindfulness training group, 19 of them completed the entire study. Three participants dropped out because they lost interest; two participants went to the hospital because of a physical condition, and one was sent to another prison. Twenty-one members of the waitlist group completed the entire study, while eight participants were transferred to another prison during the study. *t* tests and chi-square tests revealed no group differences in socio-demographic data (all $ps > 0.05$).

Procedure

Participants were recruited through oral presentations in the long-term prison. After signing informed consent, participants were randomized into the two study groups (mindfulness training group vs. waitlist control group). The pretest assessment was conducted in a quiet classroom in the prison. After the 6-week mindfulness training or the 6-week waiting period, all participants completed a posttest assessment in the same location where they completed the pretest assessment. The waitlist control group received the same mindfulness training after the posttest period (no data was collected during this time).

The mindfulness training was based on mindfulness-based cognitive therapy (MBCT) protocol developed by Segal and colleagues (Segal et al. 2002). Because some of the content designed for coping with depression was not suitable for the sample of this study, we replaced these sections with other meditation practices from the MBSR (Kabat-Zinn 1990), such as mindfulness Yoga. The general principal of the training was to keep the integral structure of MBCT while making some adjustments to meet the needs of Chinese prison

environment. For instance, in Chinese prison, all group activities must be monitored by a prison guard. Therefore, in this intervention, a prison guard who was also a psychological counselor in the prison acted as an observer. The guard also had the opportunity to learn the mindfulness technique and benefit from it as a psychological counselor.

The intervention in the current study emphasized present-focused and nonjudgmental awareness. It consisted of 2.5 to 3 h of group sessions once a week. For logistical reasons, we had to limit the intervention to a 6-week mindfulness program, which has been successfully used in an earlier study (Liu et al. 2013). In addition, a day-long retreat, which is a very important part of mindfulness training, was not possible in the Chinese prison setting. The trainings involved body scan, sitting meditation, walking meditation, yoga, and group discussions. After each group session, participants were assigned 30 to 45 min of daily homework exercises. Due to limitations of privacy and personal space to meditate, the homework exercises were replaced by a short group mindfulness practice guided by a psychological counselor of the prison. The instructors had at least 3 years of personal experience with mindfulness practices.

Measures

The Five-Facet Mindfulness Questionnaire (FFMQ; Deng et al. 2011) was assessed to measure mindfulness. This is the 39-item Chinese version of the original instrument developed by Baer et al. (2006). The FFMQ has five subscales including observing (e.g., “I pay attention to sensations, such as the wind in my hair or sun on my face”), describing (e.g., “I’m good at finding words to describe my feelings”), non-judging of inner experience (e.g., “I make judgments about whether my thoughts are good or bad”), non-reactivity to inner experience (e.g., “I perceive my feelings and emotions without having to react to them”), and acting with awareness (e.g., “I find myself doing things without paying attention”). Items are rated on a 5-point Likert-type scale from 1 (never or rarely true) to 5 (very often or always true). Higher scores indicate higher trait mindfulness. In the current study, Cronbach’s α of the total scale was 0.72. For the five subscales, Cronbach’s α ranged from 0.62 to 0.83. Nonreactivity to inner experience was the only subscale with a Cronbach’s α coefficient below 0.70. This was consistent with the study by Deng et al. (2011).

The Zung Self-Rating Anxiety Scale (SAS; Zung 1971) was used to assess anxiety. The SAS is a 20-item scale (e.g., “I feel afraid for no reason at all”) rated on a 4-point scale, ranging from 1 (none) to 4 (always). The Chinese version of the SAS was translated by Tao and Gao (1994). In the current study, Cronbach’s α was 0.90.

The Zung Self-Rating Depression Scale (SDS; Zung 1965) was used to measure depression. The SDS is a 20-item scale (e.g., “I feel down-hearted and blue”) rated on a 4-point scale, ranging from 1 (a little bit of time) to 4 (most of the time). The Chinese version of the SDS was translated by Liu et al. (1994). In the current study, Cronbach’s α was 0.83.

The Profile of Mood States (POMS; Albrecht and Ewing 1989) is a 65-item measure of present mood state. Items are rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). The POMS consists of six affective dimensions which are tension-anxiety,

depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment. A total mood disturbance score was calculated by adding the five negative subscales (i.e., tension-anxiety, depression-dejection, anger-hostility, fatigue-inertia, and confusion-bewilderment). The Chinese version is a valid instrument for the assessment of emotion (Wang et al. 2000). In the current study, Cronbach's α of total mood disturbance was 0.96. For the six subscales, Cronbach's α ranged from 0.62 to 0.96. Confusion-bewilderment was the only subscale with a Cronbach's α below 0.70, which was consistent with the Wang et al. (2000) study.

Data Analyses

Using SPSS 19.0, we tested whether the intervention led to improvement in depression, anxiety, and mood states. The sample size in each group is smaller than 30. Therefore, we tested for normality of the pretest data and found that the data of all of the scales were normally distributed (see Table 1). According to Landauer (1997), repeated measures ANOVA of small samples is acceptable if the data is normally distributed. In addition, we calculated Pearson correlations to examine the association between FFMQ, SAS, SDS, and POMS at pretest.

Results

The correlations between the dependent measures at pre-test are shown in Table 2. The FFMQ total score was negatively correlated with SAS, SDS, tension-anxiety, depression-dejection, fatigue-inertia, confusion-bewilderment, and the total mood disturbance. Table 3 shows the changes in the dependent variables from pretest to post-test. The groups did not differ on any of the dependent variables at pretest level (all $p > 0.05$). Table 4 shows the results of the ANOVA tests.

A mixed 2 (groups: mindfulness training vs. waitlist control group) × 2 (time: pretest-posttest) repeated measures ANOVA of FFMQ with time as within-subjects and group as between-subjects factors yielded a significant time-by treatment interaction, $F(1,38) = 8.71$, $p = 0.005$, and partial $\eta^2 = 0.19$.

Given the significant interaction, we conducted a follow-up simple effect analysis. The mindfulness training group had higher FFMQ total scores at posttest than the control group, $F(1, 38) = 12.91$, $p < 0.001$. No significant changes from pre-test to posttest were observed in the waitlist control group, $F(1, 38) = 0.25$, $p = 0.62$.

A repeated measures ANOVA with time as within-subjects and group as between-subjects factors yielded significant time-by-treatment interactions (all $p < 0.05$). Follow-up simple effect analyses showed that the mindfulness training group had significantly lower scores at the posttest relative to the pretest, while no differences between the pretest and posttest were found in the waitlist control group for anxiety, depression, tension-anxiety, depression-dejection, anger-hostility, confusion-bewilderment, or total mood disturbance.

Discussion

This study investigated the effectiveness of mindfulness training among Chinese long-term male prisoners. We observed negative correlations between mindfulness and negative emotions (e.g., anxiety and depression) among long-term male prisoners. These findings are in line with prior studies in which mindfulness was negatively correlated with negative emotions in other clinical and nonclinical populations (Baer 2003; Brown and Ryan 2003; Hofmann et al. 2010; Khoury et al. 2013).

The intervention led to significant improvements in participants' mindfulness level, anxiety, depression, tension-anxiety, depression-dejection, anger-hostility, confusion-bewilderment, and total mood disturbance. These results are in line with Samuelson et al.'s (2007) study that also showed a significant improvement in mood disturbance by mindfulness training in prisoners. The mindfulness training significantly enhanced participants' mindfulness level, which is also similar to Himelstein et al.'s (2012b) findings, indicating that mindfulness training can help to foster mindfulness in long-term prison inmates. Mindfulness training additionally significantly decreased participants' negative emotions, indicating that mindfulness training enhances emotional health in this population, possibly through helping them to become less reactive to emotional distress (Kabat-Zinn 1993; Teasdale et al. 2000). Another possible mechanism through which the intervention worked could have been by decreasing participants' fatigue or increasing vigor-activity (Grossman et al. 2010; Rosenzweig et al. 2003). If the results prove to be reliable, we recommend that future studies examine the mechanism of treatment change.

Most prisons in China today pay a great deal of attention to the modification of problematic behaviors while ignoring prisoners' emotional health. This study showed that mindfulness training can significantly enhance emotional health and reduce anger and hostility, which are often associated with problem behaviors. Given the convenience of these practices in the prison system and the positive feedback we received from participants and prison managers, mindfulness trainings have the potential to be valuable adjunct to other psychological interventions in prison systems in China and elsewhere. It should be noted that the long-term male prisoners who participated in this study were imprisoned for serious criminal behaviors. They had high levels of mental health problems and aggressiveness (Dai and Sun 2007; Zheng and Zhao 2009). These offenders usually also show a high level of recidivism. Mindfulness training not only can improve their emotional health but also has the potential to decrease aggressiveness, which may significantly lower recidivism (Heppner et al. 2008). More research is needed to explore the long-term effectiveness of mindfulness training on emotional health, behavioral problems, aggressiveness, and recidivism in inmates.

This study has some limitations. Firstly, although we approximated randomization, it was not entirely randomized due to scheduling issues related to the Chinese prison system. Secondly, all the results were based on self-report measures, and we were unable to collect long-term follow-up data. Thirdly, the intervention in this study was a 6-week mindfulness training without a full-day retreat. Future studies should examine whether longer mindfulness trainings are more effective. Fourthly, there is no qualitative data and behavioral data in this research. Future studies are encouraged to collect more data to investigate the

satisfaction of the mindfulness training or the specific behavioral changes caused by the intervention. Finally, the participants in this study consisted of a relatively small sample of long-term male prisoners. Therefore, the results cannot be generalized to other prison populations. However, despite these limitations, this study provides promising data to justify further studies on the effects of mindfulness trainings for long-term male prisoners.

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Table 1

Distribution tests of the pretest data

	Mindfulness training group (n =19)		Waitlist control group (n = 21)	
	Kolmogorov-Smirnov Z	**Asymp. Sig. (two-tailed)**	**Kolmogorov-Smirnov Z**	**Asymp. Sig. (two-tailed)**
FFMQ				
OB	0.688	0.731	0.525	0.946
DS	0.507	0.960	0.793	0.555
AAS	0.705	0.702	0.658	0.779
NJ	0.730	0.661	0.616	0.843
NR	0.472	0.979	0.968	0.305
T-FFMQ	0.411	0.996	0.814	0.522
SAS	0.533	0.939	0.520	0.950
SDS	0.522	0.948	0.605	0.857
POMS				
Tension-anxiety	0.685	0.737	0.494	0.967
Depression-dejection	0.595	0.871	0.688	0.730
Anger-hostility	0.670	0.761	0.499	0.965
Vigor-activity	0.711	0.692	0.879	0.422
Fatigue-inertia	0.705	0.704	0.857	0.455
Confusion-bewilderment	0.796	0.551	0.487	0.971
TMD	0.774	0.588	0.424	0.994

FFMQ total score of the Five-Facet Mindfulness Questionnaire, *OB* observing, *DS* describing, *AAS* acting with awareness, *NJ* nonjudging of inner experience, *NR* nonreactivity to inner experience, *T-FFMQ* total score of the Five-Facet Mindfulness Questionnaire, *SAS* Zung Self-Rating Anxiety Scale, *SDS* Zung Self-Rating Depression Scale, *POMS* The Profile of Mood States, *TMD* total mood disturbance

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Table 2

Correlations among the dependent variables ($n = 40$)

	T-FFMQ	OB	DS	AAS	NJ	NR
SAS	−0.39*	0.11	−0.28	−0.45**	−0.16	−0.10
SDS	−0.63***	−0.04	−0.49**	−0.54***	−0.08	−0.33*
Tension-anxiety	−0.33*	0.16	−0.12	−0.41**	−0.24	−0.13
Depression-dejection	−0.51***	0.13	−0.30	−0.53***	−0.27	−0.21
Anger-hostility	−0.26	0.17	−0.09	−0.35*	−0.24	−0.07
Vigor-activity	0.22	0.45**	−0.17	0.06	−0.04	0.20
Fatigue-inertia	−0.40**	0.02	−0.06	−0.40*	−0.20	−0.31
Confusion-bewilderment	−0.39*	0.07	−0.13	−0.40*	−0.18	−0.29
TMD	−0.42**	0.12	−0.15	−0.46**	−0.25	−0.22

FFMQ Total score of the Five-Facet Mindfulness Questionnaire, *OB* observing, *DS* describing, *AAS* acting with awareness, *NJ* nonjudging of inner experience, *NR* nonreactivity to inner experience, *T-FFMQ* total score of the Five-Facet Mindfulness Questionnaire, *SAS* Zung Self-Rating Anxiety Scale, *SDS* Zung Self-Rating Depression Scale, *POMS* Profile of Mood States, *TMD* total mood disturbance

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$

Table 3

Prechanges-postchanges of mindfulness training group and waitlist control group in dependent variables

	Mindfulness training group		Waitlist control group	
	Pretest (n = 19)	**Posttest (n = 19)**	**Pretest (n = 21)**	**Posttest (n = 21)**
FFMQ				
OB	23.37 (7.57)	25.79 (8.55)	21.47 (5.64)	17.81 (4.76)
DS	21.47(4.31)	25.11 (4.33)	20.80 (6.66)	22.43 (5.37)
AAS	26.47 (7.04)	26.89 (6.66)	23.26 (7.50)	25.24 (8.57)
NJ	25.40 (5.75)	25.32 (5.56)	24.43 (6.14)	25.52 (6.90)
NR	20.68 (4.98)	22.63 (6.08)	19.95 (4.08)	17.81 (5.44)
T-FFMQ	117.40 (13.24)	125.74 (17.08)	109.92(14.46)	108.81 (12.29)
SAS	48.12(11.48)	39.26 (7.93)	50.19(13.87)	49.14(12.76)
SDS	48.18 (9.54)	41.45 (9.36)	50.76(10.38)	49.52(12.31)
POMS				
Tension-anxiety	9.11 (6.37)	4.16(3.10)	8.52 (5.98)	9.62 (6.44)
Depression-dejection	8.47 (6.01)	4.37 (3.92)	9.62 (6.25)	9.86 (6.58)
Anger-hostility	9.69 (5.78)	5.16(4.10)	9.00 (5.31)	9.38 (6.04)
Vigor-activity	8.95 (4.70)	10.16(5.13)	7.76 (4.03)	7.48(4.12)
Fatigue-inertia	10.73 (7.14)	7.00 (5.25)	13.62 (5.65)	13.08(6.13)
Confusion-bewilderment	9.24 (4.56)	6.16(3.27)	10.38(4.08)	10.76(4.57)
TMD	47.25 (27.73)	26.84 (17.52)	51.14(24.85)	52.70 (28.28)

M table shows mean, *SD* standard deviations, *FFMQ* the total score of the Five-Facet Mindfulness Questionnaire, *OB* observing, *DS* describing, *AAS* acting with awareness, *NJ* nonjudging of inner experience, *NR* nonreactivity to inner experience, *T-FFMQ* the total score of the Five-Facet Mindfulness Questionnaire, *SAS* Zung Self-Rating Anxiety Scale, *SDS* Zung Self-Rating Depression Scale, *POMS* The Profile of Mood States, *TMD* total mood disturbance

Table 4

The results of repeated measures analyses of variance and simple effect analyses for FFMQ, SAS, SDS, and POMS ($n = 40$)

	$F_{Interaction}$	Partial η^2	F_{MT}	F_{WC}
T-FFMQ	8.71**	0.19	12 91***	0.25
OB	10.86**	0.22	3.28	8.28**
DS	2.31	0.06	14.31**	3.14
AAS	0.74	0.02	0.10	2.52
NJ	0.39	0.01	0.00	0.71
NR	8.09**	0.18	3.49	4.68*
SAS	13.75**	0.18	20.96***	0.32
SDS	5.63*	0.13	16.10***	0.60
Tension-anxiety	19.42***	0.34	24.79***	1.34
Depression-dejection	7.42**	0.16	12.63***	0.05
Anger-hostility	13.59***	0.26	22.02***	0.17
Vigor-activity	1.32	0.03	1.65	0.10
Fatigue-inertia	3.41	0.08	8.87**	0.21
Confusion-bewilderment	8.92**	0.19	13.46***	0.23
TMD	12 42***	0.25	20.42***	0.13

FFMQ the total score of the Five-Facet Mindfulness Questionnaire, *OB* observing, *DS* describing, *AAS* acting with awareness, *NJ* nonjudging of inner experience, *NR* nonreactivity to inner experience, *T-FFMQ* the total score of the Five-Facet Mindfulness Questionnaire, *SAS* Zung Self-Rating Anxiety Scale, *SDS* Zung Self-Rating Depression Scale, *POMS* The Profile of Mood States, *TMD* total mood disturbance

$F_{Interaction}$ is the interaction of group by time using repeated measure analyses of variance

F_{MT} is the simple effect analysis between pretest and posttest of mindfulness training group

F_{WC} is the simple effect analysis between pretest and posttest of waitlist control group

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$