

Mindfulness-Based Stress Reduction for Optimizing Self-Esteem and Well-Being: The Key Role of Contingent Self-Esteem in Predicting Well-Being Compared to Explicit Self-Esteem

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Abstract—This research examines the effectiveness of a mindfulness-based intervention in optimizing psychological well-being, with a particular focus on self-esteem, due to the rapid growth and consolidation of social network use and the increased frequency and intensity of upward comparisons of the self. The study aims to assess the potential of a mindfulness-based intervention to improve self-esteem and, in particular, to contribute to its greater stability by reducing levels of contingent self-esteem. Results show that an 8-week mindfulness-based stress reduction program was effective in increasing participants' (n = 206) trait mindfulness, explicit self-esteem, and well-being, while decreasing contingent self-esteem. Furthermore, the study found that improvements in both explicit and contingent self-esteem were significantly correlated with increases in psychological well-being, but that contingent self-esteem had a stronger effect on well-being than explicit self-esteem. These findings highlight the importance of considering additional dimensions of self-esteem beyond levels and suggest that mindfulness-based interventions may be a valuable tool for promoting a healthier form of self-esteem that contributes to personal well-being.

Keywords—Mindfulness-based stress reduction, contingent self-esteem, explicit self-esteem, well-being.

I. INTRODUCTION

THE mental health situation in the world has become a priority issue, with almost one billion people worldwide living with a mental health problem. The concept of mental health, according to the World Health Organization, should be understood as something "broader than the absence of mental disorders" [1]. The interest and concern for the psychological well-being of the population has increased at a time like the present, when the world is affected by the consequences of the COVID-19 pandemic [2] or by the rapid growth and consolidation of the use of social networks [3]. In this context, the development of effective interventions to optimize psychological well-being is particularly relevant [4], and self-esteem is one of the constructs with the greatest potential to be the target of this type of intervention, as it is one of the most important predictors of well-being [5]. Certain authors have long defended the idea that self-esteem should be viewed from a multidimensional perspective that goes beyond an exclusive focus on the level of self-esteem, including aspects related to its

stability or contingency [6], [7].

Mindfulness-Based Interventions (MBIs) have proven to be effective in improving various psychological conditions (depression, anxiety and stress) [8], psychological well-being [9], [10], psychological affect [11], [12] and quality of life [13].

Due to the positive role attributed to self-esteem in the development of psychological well-being [14], [15], some studies have investigated the potential impact of mindfulness on self-esteem as a possible mediator of these positive psychological effects [16], [17]. However, these studies have so far focused exclusively on the dimension of self-esteem level, so the aim of the present study is to complement these investigations by including one of the dimensions of self-esteem fragility (contingent self-esteem) as a possible mediator of the effects of an MBI on well-being.

Mindfulness is usually defined as "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" [18]. It can refer either to a "psychological trait", known as "dispositional mindfulness", or to a "state or quality of awareness", or to the practice of cultivating and strengthening mindfulness through meditation. Mindfulness as a trait refers to the general tendency to be mindful in everyday life [19], while mindfulness as a state refers to the ability to evoke a mode of mindful awareness in a given moment [20].

The volume of research on mindfulness has been steadily increasing in recent years [21] due to its contribution to the improvement of various factors related to "psychological health and well-being" [22], [23].

Mindfulness has its origins in Eastern traditions, and its recent popularity in Western psychology is largely due to the development and widespread application of standardized MBIs, which lie at the confluence of contemplative traditions, science, and the mainstream disciplines of medicine, psychology, and education [24]. The two most widely used and evaluated MBIs are mindfulness-based stress reduction (MBSR) [25] and mindfulness-based cognitive therapy (MBCT) [26]. The MBSR program is an intensive 8-week meditation course that includes weekly guided group meditation sessions, daily guided meditation exercises to be practiced at home using audio recordings (e.g., focusing on breathing and body sensations as

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the object of meditation), and a one-day meditation retreat conducted largely in silence.

Various reviews and meta-analyses have demonstrated the effectiveness of MBIs in increasing self-reported mindfulness [27], [28], reducing anxiety, depression and stress [29]-[31] and improved well-being [32]-[34]. A very recent paper [35] systematically reviewed 44 meta-analyses (representing 336 RCTs with 30,483 participants) demonstrating the efficacy of MBIs on several outcomes related to psychological functioning. These improvements in psychological functioning as a result of MBI interventions are driven by the demonstrated mediation of trait mindfulness [36]-[39]. Instruments such as the Five Facet Mindfulness Questionnaire (FFMQ) [40] are commonly used to assess trait mindfulness in these intervention studies.

The identification of possible mechanisms through which mindfulness and its practice may produce these beneficial effects has been a prevalent area of interest in research. Bishop et al. [41] proposed two key components: self-regulation of attention and a particular orientation towards experience. Self-regulation of attention refers to attention focused on the present moment and involves the ability to observe and attend to a constantly changing stream of thoughts, feelings and sensations in each moment. This self-regulation of attention would facilitate an awareness of thoughts, emotions and sensations based on the direct experience of these processes, as opposed to elaborative or cognitive processing of these experiences. The second component involves a certain orientation towards experience; this is a curious and non-judgmental attitude towards the experience of the present moment, and a stance of acceptance and openness to whatever arises in each moment. Despite the semantic ambiguity of the term "mindfulness" used in the research, there seems to be "agreement that mindfulness implies attention and awareness with some important qualities about the nature of those faculties" [21], mainly the facet of acceptance or non-judgment reported in most self-report measures [42].

The initial interest in studying the potential effects of mindfulness on personal well-being led to the inclusion of related constructs, such as self-esteem, among its possible beneficial effects [19]. Self-esteem is one of the most popular topics of study in modern psychology [43] and was originally defined as a unidimensional construct referring to a person's general sense of worth [44]. People with high self-esteem have positive and well-articulated beliefs about the self, whereas the beliefs of people with low self-esteem are uncertain or outright negative [45]. Therefore, self-esteem does not necessarily reflect a person's objective talents and abilities, or even how a person is judged by others.

A large number of studies have examined the relationships between levels of self-esteem and various outcomes, finding a positive association of high self-esteem with overall life satisfaction [46], greater happiness [47] and positive affect [48], and a negative association with depression [49], [50]. A recent meta-analysis [43] notes that "although research to date cannot prove causality", self-esteem contributes positively to "having more satisfying relationships, performing better at school and work, enjoying better mental and physical health, and avoiding

antisocial behaviour". However, despite the widely documented positive outcomes associated with high self-esteem, several studies have highlighted the potential drawbacks and vulnerabilities associated with the pursuit of self-esteem [14]. In the last two decades, researchers have responded to these heterogeneous findings from studies on self-esteem levels by adopting a broader, multidimensional approach to self-esteem, considering it in terms of stability in addition to level [51], [52]. This means that there would be two different types of self-esteem: one that is relatively permanent (i.e., stable, secure, authentic) and another that is relatively temporary (i.e., unstable, fragile, inauthentic) [7].

One of the processes that would cause such changes or fluctuations in self-esteem would be the contingent nature of self-esteem [53]. Unlike secure self-esteem, contingent self-esteem fluctuates in response to positive and negative events and achievements related to the person, such as physical appearance or academic competence [54], [55]. People whose self-esteem is more contingent are more sensitive to failure, become more vigilant about the possibility of failure, and develop costly ways of avoiding failure or defending against its significance when it occurs [56], and are likely to report more depressive symptoms [57]. In this sense, the increasing use and presence of social networks around the world and in the daily lives of all types of people [96] implies an increased exposure to the frequency and intensity of upward comparisons on the self [58]. Studies of the effects of social network use on self-esteem show mixed results [59], with individual differences in people in domains such as social comparison orientation or contingent self-esteem acting as moderators of the effects of social networks on self-esteem [60].

Despite the desirability of considering other dimensions of self-esteem beyond the level of self-esteem, this has been the focus of virtually all studies of the potential impact and relationship between mindfulness and self-esteem. In the review by Randal et al. [61], 15 cross-sectional studies found significant positive correlations between dispositional mindfulness and self-esteem levels, and most of the MBI studies resulted in significant increases in self-esteem levels. The most common intervention used in these studies was MSBR. Only a very limited number of studies have examined the potential of MBIs on aspects related to fragile self-esteem. Koole et al. [62] found that meditation increased congruence between implicit and explicit self-esteem, which is considered one of the possible markers of fragile self-esteem. Only one study is known to have examined the effects of MBI on contingent self-esteem. Rajamäki [63] investigated the effects of an MBSR intervention on reducing competence-based self-esteem [64].

People whose self-esteem is more contingent are more likely to feel good about themselves only when they receive approval, praise, or success in terms of social standards or self-imposed objective goals [64]. According to Sociometer Theory [65], some degree of self-esteem contingency is beneficial to the individual [66]. However, people with high levels of contingent self-esteem require ongoing and consensual validation, and success or failure can produce intense positive or negative

affect, leading to extreme fluctuations in self-esteem [67]. Such heightened sensitivity to failure involves increased vigilance to the possibility of failure and the maintenance of costly ways of avoiding failure or defending oneself when failure occurs [56].

Following Bishop et al.'s two-component model of mindfulness [41], a theoretical framework is established that would justify why mindfulness might contribute to the improvement of contingent self-esteem. On the one hand, the demonstrated improvement in attentional skills as a result of meditation and MBIs [68], [70] may lead to greater and more accurate awareness of incoming internal and external stimuli, attenuating affective biases [71] and making one's habitual responses more conscious and less automatic [72]. Furthermore, mindfulness involves a non-judgmental, non-reactive and open attitude towards emotions, experiences and thoughts [40]. Therefore, an individual with high levels of dispositional mindfulness could become aware of negative thoughts or opinions about the self without having to make efforts to avoid or change these experiences [73], [74] and also without becoming 'trapped' in these experiences, which would lead to the application of better and less costly self-regulatory strategies [75]. This is consistent with the proposition that mindfulness may be associated with increased self-esteem, particularly secure forms of self-esteem [76], and with findings that induction of mindfulness states contributes to an increase or restoration of self-esteem status [77], and that the non-judgement facet appears to be most strongly associated with increased self-esteem [17], [76].

The aim of this study is to demonstrate that a mindfulness intervention will lead to an improvement in both explicit and contingent self-esteem, with the latter contributing to a greater extent to the improvement in personal well-being that occurs as a result of the mindfulness intervention. To the extent that a person with lower contingent self-esteem is less vulnerable to fluctuations in the state of their self-esteem, they can allocate more resources to effective self-regulation [56], which would be a key determinant of psychological well-being [78] and essential for managing goal-directed behavior [79], [80], allowing people to engage in activities that are consistent with their values, needs, and interests, thus promoting a eudaimonic sense of well-being [81], [83].

The hypotheses to be tested in the present study are:

- Hypothesis 1: An MBSR intervention will result in an increase in trait mindfulness and personal well-being, as well as an increase in explicit self-esteem and a decrease in contingent self-esteem.
- Hypothesis 2: Changes in explicit and contingent self-esteem as a result of the MBSR intervention will each predict significant incremental variance in well-being, with contingent self-esteem being a stronger predictor of well-being than explicit self-esteem.

II. MATERIALS AND METHODS

A. Participants

The study participants consist of adult individuals who voluntarily registered for distinct 8-week MBSR programs.

These courses were conducted in adherence to the prescribed methodology and standards developed by Kabat-Zinn [18] at the University of Massachusetts.

B. Procedure

The MBSR program, a collective 8-week curriculum, comprises weekly 2.5-hour sessions directed by a proficient instructor, supplemented by a 1-day retreat. Participants undertake various techniques, including body scanning, sitting meditation, yoga and movement exercises, and mindfulness practices in everyday life. All 13 instructors involved in teaching the program were authorized instructors from the Center for Mindfulness at the University of Massachusetts with substantial experience in delivering MBSR programs.

Instructors were contacted by email to request their written consent to participate in the study, and they were responsible for informing their students of the aim and requirements for participation in the study during the first session of the course. The research procedure involved an online assessment conducted during the first week of the program (pre-evaluation), followed by another online evaluation administered in the week after the program's conclusion (post-evaluation). Upon completing both assessments, participants were granted access to a personal report displaying pre-post changes in the questionnaire measures.

C. Measures

In the present study, different instruments were used to assess the variables under examination. The internal consistency of measures obtained from the current study participants, as assessed using Cronbach's alpha, is presented in Table I. Moreover, the Intraclass Correlation Coefficient was employed to estimate the 95% confidence interval for the reliability measure.

Mindfulness trait: was measured using the short form of the Five Facets Mindfulness Questionnaire (FFMQ-SF) [84]. This questionnaire consists of 24 items measuring five different dimensions of mindfulness [40]: observing (4 items), describing (5 items), acting with awareness (5 items), nonjudging of inner experience (5 items), and nonreactivity to inner experience (5 items). The internal consistency of the instrument was found to be robust, with a Cronbach's alpha coefficient of .879, while the reliability coefficients for the disaggregated dimensions ranged from .804 to .876.

Explicit Self-esteem: was measured using the Rosenberg Self-Esteem Scale (RSES) [44], a 10-item scale that measures global self-worth by measuring both positive and negative feelings about the self. The scale is assumed to be one-dimensional. The internal consistency of the instrument was found to be robust, with a Cronbach's alpha coefficient of .868.

Contingent self-esteem: was measured using the Contingent Self-Esteem Scale (CSES) [55]. This questionnaire consists of 26 items and comprises two main dimensions: competence-based self-esteem, where self-esteem is defined by daily performance outcomes, and relation-based self-esteem, where self-esteem depends on emotional reassurance from others. Moreover, the two dimensions are further broken down into

different sub-dimensions: two sub-dimensions for the competence-based dimension (contingent upon competence and self-critical) and three sub-dimensions for the relation-based dimension (rejection, contingent upon love, and compliance). The instrument demonstrated robust internal consistency with a Cronbach's alpha coefficient of .928 for the full scale. Furthermore, the reliability coefficients obtained for the dimensions and sub-dimensions were high or very high, ranging from .773 to .913.

Psychological well-being: was measured using the Spanish adaptation of the Ryff Scale of Psychological Well-Being (PWB) [85]. This questionnaire consists of 29 items and six dimensions of psychological well-being: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The reliability analysis of the complete questionnaire revealed a very high coefficient (.920). Furthermore, three of the dimensions demonstrated high reliability with coefficients greater than .800, while the remaining three dimensions demonstrated good reliability coefficients ranging from .642 to .760.

D. Data Analysis

Descriptive statistics were computed for relevant demographic variables. Means and standard deviations were calculated for all pre- and post-MBSR training measurements. Additionally, the Kolmogorov-Smirnov test was employed to examine the normal distribution of these measurements.

Changes in study variables from pre- to post-MBSR training were evaluated using paired t tests. The sizes of effects were quantified using Cohen's d measure [86].

We assessed the hypothesis that contingent self-esteem would be a stronger predictor of well-being than explicit self-esteem with partial correlations using total scores for all variables. Statistical analyses were performed using IBM SPSS v27.

III. RESULTS

The final sample consisted of 206 participants, of whom 150 were women (72.8%) and 56 (27.2%) were men. They ranged in age between 20 and 65 years old ($M = 33.9$, $SD = 11.49$). The majority (82.55%) were active workers (59.2% salaried and 23.3% self-employed).

Changes in all variables from pre- to post-MBSR are presented in Table II. Results demonstrated that at post-training there were statistically significant and large increases in the mindfulness trait (FFMQ-SF $p < .001$, $d = 1.50$), explicit self-esteem (RSES $p < .001$, $d = 0.98$) and psychological well-being (PWB $p < .001$, $d = 0.97$). Likewise, there was a statistically significant and large decrease in the contingent self-esteem (CSES $p < .001$, $d = -1.07$).

Bivariate Pearson's correlations established that there was a strong, statistically significant linear relationship between contingent self-esteem and psychological well-being ($r = -.581$, $p < .001$), a moderate, statistically significant linear relationship between contingent self-esteem and explicit self-esteem ($r = -.450$, $p < .001$) and a strong, statistically significant linear relationship between explicit self-esteem and psychological

well-being ($r = .527$, $p < .001$).

TABLE I
CRONBACH'S ALPHA RELIABILITY TEST OF THE PRE-MBSR QUESTIONNAIRES

Variables	Number of Items	Cronbach's Alpha	ICC (95% CI)	P
Total mindfulness (FFMQ-SF)	24	879	.853 / .901	.000
Dim. observing	4	847	.809 / .878	.000
Dim. describing	5	867	.836 / .894	.000
Dim. acting with awareness	5	876	.847 / .901	.000
Dim. nonjudging	5	804	.758 / .843	.000
Dim. nonreactivity	5	804	.759 / .844	.000
Total explicit self-esteem (RSES)	10	868	.839 / .893	.000
Total contingent self-esteem (CSES)	26	928	.913 / .942	.000
Dim. competence	12	860	.830 / .887	.000
Subd. competence	8	773	.724 / .817	.000
Subd. self-critical	4	844	.806 / .876	.000
Dim. relation	14	913	.895 / .930	.000
Subd. rejection	6	876	.847 / .900	.000
Subd. love	4	854	.818 / .884	.000
Subd. compliance	4	814	.769 / .852	.000
Total psychological well-being (PWB)	29	920	.903 / .935	.000
Dim. self-acceptance	4	886	.859 / .910	.000
Dim. positive relations	5	818	.776 / .855	.000
Dim. autonomy	6	735	.674 / .787	.000
Dim. environmental mastery	5	642	.559 / .714	.000
Dim. personal growth	4	760	.701 / .809	.000
Dim. purpose in life	5	814	.770 / .851	.000

N = 206. ICC= intraclass correlation coefficient; CI= confidence interval; Dim= dimension; Subd= subdimension. Dimensions and subdimensions with Cronbach's alpha above .800 are in bold.

The partial correlation between contingent self-esteem and wellbeing, controlling for explicit self-esteem was -0.453 ($p < .001$). The partial correlation between explicit self-esteem and wellbeing, controlling for contingent self-esteem, was 0.365 ($p < .001$). The difference between these two correlations is significant (z -score= -5.097, $p < .001$), suggesting that contingent self-esteem is a stronger predictor of well-being than is explicit self-esteem, although each predicts significant incremental variance in wellbeing after accounting for the other.

IV. DISCUSSION

The overall results show that the MBSR program was effective in increasing trait mindfulness, explicit self-esteem, and well-being, and in decreasing contingent self-esteem. It is noteworthy that the magnitude of change from pre- to post-MBSR is highly significant for all the variables examined, as well as for all the dimensions analyzed.

These general findings are consistent with previous research showing that an MBSR program leads to increases in trait mindfulness [87], [88], explicit self-esteem [61], and improvements in personal well-being [89], [90]. However, only one previous study [63] is known to have demonstrated the effect of an MBSR program on reducing contingent self-esteem, with important limitations due to the small sample size ($n = 29$) and the fact that the majority of participants were women with a diagnosis of breast cancer, which limits the

generalizability of the findings. Our results clearly support the impact of an MBSR program on reducing contingent self-esteem, with a highly significant effect. Our study therefore contributes to this field of application of MBSR programs for improving one of the dimensions of fragile self-esteem, namely

contingent self-esteem, and complements the more common field of research on the effects of mindfulness interventions, which focuses mainly on their effects on self-esteem levels.

TABLE II
 DESCRIPTIVE STATISTICS AND T TESTS FOR PRE- AND POST-MBSR TRAINING

Variables	Mean (SD)		Mean Dif.	95% CI	t (205)	p	Cohen's d
	Pre-MBSR	Post-MBSR					
Total mindfulness (FFMQ-SF)	2.92 (0.53)	3.65 (0.52)	0.72	0.65 / 0.79	21.56	.000**	1.50
Dim. observing	3.22 (0.92)	3.94 (0.76)	0.73	0.63 / 0.83	13.92	.000**	0.97
Dim. describing	3.45 (0.71)	3.91 (0.67)	0.47	0.39 / 0.54	11.82	.000**	0.82
Dim. acting with awareness	2.54 (0.75)	3.37 (0.69)	0.83	0.73 / 0.94	15.70	.000**	1.09
Dim. nonjudging	2.87 (0.76)	3.59 (0.74)	0.72	0.62 / 0.81	14.79	.000**	1.03
Dim. nonreactivity	2.60 (0.66)	3.46 (0.66)	0.86	0.77 / 0.95	18.86	.000**	1.31
Total explicit self-esteem (RSES)	2.93 (0.48)	3.29 (0.44)	0.36	0.31 / 0.41	14.08	.000**	0.98
Total contingent self-esteem (CSES) (r)	3.19 (0.64)	2.67 (0.62)	-0.52	-0.46 / -0.59	-15.42	.000**	-1.07
Dim. competence (r)	3.01 (0.71)	2.49 (0.65)	-0.52	-0.45 / -0.59	-14.09	.000**	-0.98
Subd. competence (r)	2.96 (0.69)	2.54 (0.66)	-0.42	-0.34 / -0.50	-10.68	.000**	-0.74
Subd. self-critical (r)	3.10 (0.97)	2.38 (0.84)	-0.72	-0.63 / -0.82	-14.53	.000**	-1.01
Dim. relation (r)	3.35 (0.71)	2.83 (0.69)	-0.52	-0.45 / -0.60	-13.90	.000**	-0.97
Subd. rejection (r)	3.39 (0.85)	2.77 (0.83)	-0.62	-0.53 / -0.71	-13.23	.000**	-0.92
Subd. love (r)	3.91 (0.74)	3.56 (0.78)	-0.35	-0.26 / -0.44	-7.67	.000**	-0.53
Subd. compliance (r)	2.74 (0.86)	2.19 (0.80)	-0.55	-0.45 / -0.65	-10.74	.000**	-0.75
Total psychological well-being (PWB)	4.29 (0.66)	4.71 (0.59)	0.42	0.36 / 0.48	13.94	.000**	0.97
Dim. self-acceptance	4.18 (0.90)	4.69 (0.77)	0.51	0.43 / 0.59	12.33	.000**	0.86
Dim. positive relations	4.60 (0.92)	4.92 (0.81)	0.32	0.24 / 0.40	7.59	.000**	0.53
Dim. autonomy	3.96 (0.86)	4.43 (0.83)	0.48	0.39 / 0.56	11.24	.000**	0.78
Dim. environmental mastery	4.23 (0.78)	4.66 (0.74)	0.43	0.35 / 0.51	10.35	.000**	0.72
Dim. personal growth	4.73 (0.81)	5.13 (0.66)	0.40	0.30 / 0.50	7.99	.000**	0.56
Dim. purpose in life	4.18 (0.95)	4.57 (0.82)	0.38	0.30 / 0.46	9.45	.000**	0.66

SD = Standard deviation; CI = confidence interval; dif = difference; Dim = dimension; Subd = subdimension. Reverse-scored items are denoted with an (r). Effect sizes (Cohen's d) cutoff scores are as follows: 0.2—small, 0.5—medium, and 0.8—large. Effect sizes above 0.80 are in bold. **p < .01.

In addition, as hypothesized, the results show that although improvements in both explicit and contingent self-esteem derived from the MBSR program are significantly correlated with increases in psychological well-being, it is contingent self-esteem that has a greater effect on well-being than explicit self-esteem. The results suggest that participation in an MBSR program may allow people to increase their ability to self-regulate emotions in order to manage possible fluctuations in self-esteem as a result of external events that might affect it. Regulating attention to the experience of the present moment through non-judgmental observation would allow people to recognize unpleasant, difficult and painful mental events and develop the will to hold them in awareness without avoiding or repressing them. Individuals with contingent self-esteem are so preoccupied with validating their self-concept that they are more likely to experience high emotional regulation costs following an ego threat in a relevant domain [91], so developing mindfulness skills would reduce the perceived threat of external opinions and judgments and increase openness to experience, allowing the person to accept information about the self with greater emotional equanimity, thus reducing the amount of attentional resources needed to protect or maintain their self-concept.

Because people with contingent self-esteem rely on

continuous external validation of their self-worth, they are forced to engage in constant cognitive reassessment of their self-concept [92], with the negative consequence of depleting the limited pool of self-regulatory resources. Therefore, to the extent that self-esteem fluctuates less throughout the day as a result of external events, there is greater emotional stability, which would contribute to greater happiness and personal well-being [93]. In this sense, our study would support proposals [51], [94] to consider other dimensions in addition to self-esteem levels, as they seem to have a greater potential to contribute to a healthier form of self-esteem with less intensity of self-evaluation, ego-defensiveness and greater stability.

V. LIMITATIONS

Despite the promising outcomes of the research, there are several constraints that need to be considered while interpreting the results and guiding future investigations. Firstly, this was an uncontrolled pilot study that evaluated the pre-post MBSR program of a self-selected participant sample using measures. Hence, these findings are preliminary and require further exploration with a more rigorously designed randomized controlled trial that incorporates active controls and longitudinal data. Secondly, this study solely collected data via

self-report measures, which have sound psychometric properties, but are always vulnerable to various biases, such as social desirability. Thirdly, improvements in mindfulness-related symptoms are often non-linear and may last for months after treatment [95]. Hence, it is suggested to include follow-up evaluations. Lastly, in this study, the data were analyzed based on global scores of each construct. Consequently, future longitudinal studies should investigate sub-dimensions of the present constructs.

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