

Focus on Your Breathing: Does Meditation Help Lower Rumination and Depressive Symptoms?

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ABSTRACT

The present study examines the relationships between meditation, rumination and depressive symptoms. Research to date has found that individuals who meditate experience less ruminative thinking and have lower depressive symptoms than individuals who do not meditate. While most psychological studies in this area examined the influence of controlled attention focused therapies on rumination and depression, this study describes the relationships between these indices in a non-clinical population. We hypothesize that: 1) The longer meditators practice meditation, the less they will experience ruminative thinking and depressive symptoms; 2) Meditators will have less ruminative thinking and depressive symptoms than non-meditators; 3) Different measures of meditation and ruminative thinking will negatively predict depressive symptoms; and 4) The relation between ruminative thinking and depressive symptoms will be positive and stronger among non-meditators than among meditators. 150 participants, about half of them practicing meditation, were sampled via social networks and answered questions pertaining to ruminative thinking, depressive symptoms and their meditation practice. Participants who practiced meditation for a longer period of time reported less rumination and depressive symptoms. Furthermore, meditators experienced significantly less ruminative thinking (but not depressive symptoms) than non-meditators. Moreover, rumination was found to positively predict depressive symptoms, while meditation measures did not. Finally, the relationship between ruminative thinking and depressive symptoms was found to be positive, significant and stronger among non-meditators than among meditators. Persistent meditation may have long lasting effects on lowering ruminative thinking and depressive symptoms.

Key words: meditation, rumination, depressive symptoms.

Novelty and Significance

What is already known about the topic?

- Individuals who meditate experience less ruminative thinking and have lower depressive symptoms than individuals who do not meditate.
- Most psychological studies in this area examined the influence of controlled attention focused therapies on rumination and depression in clinical settings.

What this paper adds?

- This study describes the relationships between meditation, ruminative thinking, and depressive symptoms in a non-clinical population.
- Participants who practiced meditation for a longer period of time reported less rumination and depressive symptoms. Meditators experienced significantly less ruminative thinking (but not depressive symptoms) than non-meditators.
- Rumination was found to positively predict depressive symptoms, while meditation measures did not. Persistent meditation may have long lasting effects on lowering ruminative thinking and depressive symptoms in non-clinical samples.

The word *Meditation* describes a wide range of practices used to regulate the body and mind (Cahn & Polich, 2006). The American Psychological Association's (APA) dictionary defines meditation as a deep, prolonged reflective contemplation, which is often designed to alter the state of the consciousness. Meditation is traditionally associated

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with spiritual and religious practice, but nowadays it is also used for the purposes of gratification, relaxation and stress reduction (VandenBos, 2007). Thus, *Meditation* is a general name for a diversity of practice methods, designed to foster emotional stability and improve the quality of life.

The field of Buddhist psychology is no stranger to the field of psychoanalysis. Freud even mentioned meditation as early as in his writings from 1930, where he claimed that the feeling of serenity inspired by meditation is essentially an experience of regression -thus creating a comparison between the two fields (Germer, Siegel, & Fulton, 2005). In the 1960's, ideas regarding enlightenment began to make their way into the West, following famous pioneers such as The Beatles, who had experienced different meditation related practices in India. During that time, some therapists also began trying to integrate their clinical practice with Eastern traditions (Germer *et al.*, 2005; Vaughan, 1984). Research on meditation flourished and in 1977, the APA called for a clinical examination of the effects of meditation, as part of the ongoing trend in the field (Shapiro, 1984).

Most meditation practice methods can be roughly divided into two main styles; The first is *Focused Attention Meditation* in which a person is taught to focus his or her attention on a particular object (Manna, Raffone, Perrucci, & *et al.*, 2010). This focusing is supposed to bring down regulatory and thought processes and allow the meditator the ability of deepening awareness to the inner self (Lutz, Slagter, Dunne, & Davidson, 2008). The second style is called *Open Monitoring Meditation*. In this practice, the meditator pays attention to the content of his or her own experience (emotional, cognitive and physical) without responding to this experience in any way (Lutz *et al.*, 2008; Manna *et al.*, 2010). Others may use different terminology to describe the distribution of the two styles of meditation and distinguish insight meditation *Vipassana* (now also referred to in the psychological literature as *Mindfulness*) and *Concentration Meditation -Samata* (Germer *et al.*, 2005).

Scientific literature in the past 10 years regarding this area focused mainly on Mindfulness Meditation (Mindfulness; Germer *et al.*, 2005). Cognitive theorists describe Mindfulness as a form of conscious attention, in which one observes thoughts free of judgment and without attachment; that is without repeated rumination of the thoughts, but simply observing them while paying attention to their existence and moving on to the next thought (Frewen, Evans, Maraj, Dozois, & Partridge, 2008; Mason & Hargreaves, 2001). In Mindfulness Meditation, those who practice it (meditators) learn to let their mind wander into the past, into the future or towards a chain of associations. Tools such as paying attention to breathing, counting breaths, and labeling thoughts or experiences as emotions, pain, planning or judgment are often used by meditators in order to return to a state of conscious attention. Eventually, it is expected from the meditators to develop a deeper awareness of their thought patterns without experiencing the reactions (feelings, or other thoughts) that these patterns typically awaken. This should lead to acceptance of thoughts without judgment and to further emotional stability (Sedlmeier, Eberth, Schwarz, Zimmermann, Haarig, *et al.*, 2012; Deatherage, 1975).

Commonly used in the recent clinical literature, the word *Mindfulness* refers to the awareness that emerges as a byproduct of nurturing three skills related to one another:

The first is paying intentional attention to events occurring from moment to moment as they befall in both the inner and outer world. The second skill is noticing responses derived from habit to these events, often characterized by rejection or attachment, and usually result in ruminative thinking or avoidance behavior. Finally, the third skill is fostering the ability to respond to these events and one's reactions to them, out of curiosity and compassion (Williams, 2008).

Various researchers hypothesized that meditation can have an effect on cognitive processes relevant to the emotional experience. Their findings indicated that practicing meditation reduces destructive emotions and emotional behaviors as well as cognitive processes leading to feelings of this sort (Kemeny, Foltz, Cavanagh, Cullen, Giese-Davis, Jennings *et al.*, 2012). Moreover, studies have found that subjects who scored high on MAAS (*Mindful Attention Awareness Scale*; Baer, Smith, & Allen, 2004) were low on repetitive negative thinking (Brown & Ryan, 2003). Frewen *et al.* (2008) found that Mindfulness was negatively related to the frequency of negative thoughts and the perception of the ability to let go of negative thoughts. Other studies have found an inverse relation between the level of the ability to remain attentive to one's breathing and measures of rumination (Burg & Michalak, 2011) and have shown that Mindfulness Meditation practice leads to a decrease in rumination (Ramel, Goldin, Carmona, & Mcquaid, 2004).

Trapnell and Campbell (1999) observed that ruminative thinking is only one aspect of self-focus, and claimed that self-focus may not always lead to positive outcomes. They named this phenomenon the *self-absorption paradox*. The paradox describes a contradiction, in which high levels of self-awareness relate simultaneously to high levels of psychological distress and to psychological wellbeing, and not only to a reduction of ruminative thinking, as Mindfulness psychologists might suggest. Thus, researchers have found it necessary to distinguish between two forms of self-attention: Self-reflection (which is typically termed for positive self-reinforcements) and rumination (repetitive negative thinking) (Trapnell & Campbell, 1999). This distinction between a 'useful' and a 'non-useful' form of self-attention has been an attempt to resolve the paradox. Similarly, a study that examined the relationship between empathy and the self-absorption paradox provides further support for the distinction between the two forms of self-attention as one form has generally adaptive results (self-reflection) and the other has generally non-adaptive results (self-rumination) (Joireman, Parrott, & Hammersla, 2002).

The concept *self-reflection* is defined as an intellectual category of self-attention, characterized by reflections on one's self, derived not by distress but by epistemic curiosity, namely out of internal interest and enjoyment of abstract or philosophical thinking. Self-reflection promotes the individual's knowledge of himself (Trapnell & Campbell, 1999; Hixon & Swann, 1993). In contrast, the concept *rumination* is defined as thinking repeatedly about negative information (Whitmer & Gotlib, 2013). It is a cognitive process involving repetitive negative thoughts, which include an emphasis on negative experiences and past failures (Kemeny *et al.*, 2012). Trapnell and Campbell (1999) define rumination as a neurotic category of self-attention, awakened by threats, loss or injustice toward the self (i.e. recurrent thoughts about the self, linked to anxiety, depression and anger, respectively). They view this chronic form of self-attention as

oriented towards the past. In their study, they found that rumination is associated with a lower level of *taking things in perspective* and higher levels of personal distress.

Individual differences in measures of Mindfulness were found to be negatively related to the frequency in which participants experienced ruminative thinking and positively related to the ease with which they were able to let go of these thoughts (Frewen *et al.*, 2008). In addition, researchers found that patients who underwent an MBCT course (*Mindfulness-Based Cognitive Therapy*) for eight weeks showed a significant decrease in rumination (Michalak, Hölz, & Teismann, 2011). The theoretical background of the MBCT program suggests that Mindfulness prevents recurrence of depressive episodes by teaching participants to disengage from processes of ruminative thinking; Once such processes are identified by the participants, they should regain their consciousness to the present moment, by paying attention to their breathing, for instance. Therefore, participants who are high in Mindfulness should report less of a ruminative response style to a negative mood. Recent studies show results of negative correlations between the level of the ability to pay attention to breathing and measures of ruminative thinking and depression; namely, as the ability to pay attention to breathing is higher, the levels of ruminative thinking measured is lower (Burg & Michalak, 2011; Segal, Williams, & Teasdale, 2002). Another study, comparing a group of people who practice meditation versus those who did not practice meditation, found that the meditators presented a decrease in rumination and an increase in Mindfulness (Kemeny *et al.*, 2012).

Ruminative thinking is becoming increasingly recognized in scientific literature as a known risk factor for depression. Findings provide evidence of a relation between ruminative thinking, negative cognitive style and depressive symptoms (Lo, Ho, & Hollon, 2010). In addition, ruminative thinking was found to lead to a variety of non-adaptive results, including more severe and longer depressive episodes (Whitmer & Gotlib, 2013). In fact, the use of meditation as a therapeutic tool in the effort to treat depression relies on reducing ruminative thinking tendencies, while simultaneously increasing control of attention monitoring (Ramel *et al.*, 2004).

According to Nolen-Hoeksema's (1991) Response Styles Theory, the way in which individuals respond to symptoms of depression is associated with the duration of the symptoms they are experiencing. Responses of rumination towards depression tend to prolong the duration of the depression, as they cause bias towards negative thinking and also interfere with behavioral functioning and problem solving ability. Nolen-Hoeksema argues that individuals who tend to engage in ruminative thinking in response to depression often focus on the causes and possible consequences of their depression symptoms and therefore may suffer from a more severe depression for a longer period of time than people who adopt various measures designed to distract themselves from the symptoms. A study which sought to examine this theory examined young adults who suffer from different levels of depressive symptoms once a week for seven weeks and found that high levels of ruminative thinking were related to higher levels of depressive symptoms (Grassia & Gibb, 2008).

Mindfulness has been found to be associated with a lower frequency of cognitions related to depression, worry and social fears and an increased ability to 'let go' of negative thinking when it occurs (Burg & Michalak, 2011; Frewen *et al.*, 2008). Moreover,

research comparing participants of a meditation course and controls, found that among participants in the course, there was a sharp decline in depression, compared to controls, and the effect was maintained even five months after course termination (Kemeny *et al.*, 2012). Lykins and Baer (2009) argue that although meditation is usually perceived as a lifetime lasting process, most of the knowledge gained up to date on its effects is based on short term practitioners who were part of a mindfulness-based treatment. Thus, we see great importance in focusing on long-term meditation practitioners, when trying to add information to the exiting body of knowledge.

To summarize, research to date has found that meditators experience less ruminative thinking than non-meditators. In addition, depressive symptoms of meditators have been found to be lower than those of non-meditators. The aim of this study is to examine the relation between meditation, ruminative thinking, and depressive symptoms. Most psychological studies in this area to date examined the influence of controlled attention focused therapies on rumination and depression. In this study we wish to describe the relationships between these indices in a non-clinical sample, and to assess whether life-long meditation has an impact on everyday life. The importance of this study is in emphasizing the relationship between meditation and depressive symptoms, via reducing ruminative thinking in a large community based sample.

We hypothesize that: 1) The longer meditators practice meditation (since they started and also the more they practice during the week), the less they will experience ruminative thinking and depressive symptoms; 2) Meditators will have less ruminative thinking and depressive symptoms than non-meditators; 3) Measures of meditation (monthly practices, the number of practices per week and the number of daily minutes of meditation practice) and ruminative thinking will negatively predict depressive symptoms; and 4) the relation between ruminative thinking and depressive symptoms will be positive and stronger among non-meditators than in meditators.

METHOD

Participants

The sample consisted of 150 participants (113 female), between 18-68 years of age ($M= 35.15$; $SD= 13.06$). About half of the participants were single (52.7%) and 40.7% were married; 6.00% were divorced and 0.70% (one participant) widowed. Participants had 12-25 years of education ($M= 15.43$; $SD= 2.44$). Of the 275 participants who started the research 125 did not complete it and thus were removed from the sample. This may be due to the subject of the study (meditation) and the fact that some people did not wish to answer questions of this sort. Of the 150 (54.5% consent rate) participants in this study 63 (42%) were meditators and 59 were non-meditators. The meditators practiced meditation between 1 month and 3 years (with a mean of 53.48 months; $SD=68.24$). The mean number of weekly meditation practices was 4.41 ($SD= 2.7$, range, 1-14 weekly practices) and the mean number of minutes of each practice was 27.94 ($SD= 13.25$, range, 10-60 minutes per practice; see Table 1). All the participants in this study chose to participate and did not receive any form of compensation.

Procedure

Participants received a link to a Web site that allowed them to complete the measures online. The link was forwarded to participants via email, social networks and different meditation forums. Only the participants and the researchers had access to the survey site.

Measures

- *Meditation*. Participants were asked if they practice meditation (to which the answer was Yes\No). If they replied No the questioner ended; if they replied Yes they continued to answer three more questions regarding meditation practicing habits. Participants were asked how many months they have been practicing meditation, how many times a week and how many minutes each practice lasts.
- *Rumination* was measured using the Rumination sub-scale from the *Rumination-Reflection Questionnaire* (RRQ; Trapnell & Campbell, 1999). The rumination sub-scale is a 12 item 5-point Likert (ranging from strongly agree to strongly disagree) scale designed to examine the extent to which participants engage in self-ruminative thought. An example for an item: "I tend to ruminate or dwell over things that happen to me for a really long time afterward". The score for every participant is the mean of the 12 items in the sub-scale. The RRQ had been previously used in studies that examined self-reflection and ruminative thinking as predictors of psychological well-being and empathy (Harrington & Loffredo, 2010; Joireman *et al.*, 2002). The original sub-scale was reported of having high reliability ($\alpha = .90$). For the present study, the RRQ was translated into Hebrew by translation, independent back-translation, and revision by fluent bi-lingual English and Hebrew speakers. The RRQ in Hebrew had excellent reliability (Cronbach's $\alpha = .90$).
- *Depressive symptoms* were measured with the *Center for Epidemiological Studies Depression Scale* (CES-D; Radloff, 1977). A 20 item 4-point Likert-type scale ranging from rarely or none of the time (less than 1 day) to most or all of the time (5-7 days). The scale is designed to estimate depressive symptoms in a broad population (as experienced in the past week). The score for every participant is the mean of the 20 items in the sub-scale. The CES-D had been previously used in a research that examined the healthy quality of Mindfulness breathing and it's relation to ruminative thinking and depression. Researches pointed out that the CES-D is designed to evaluate depressive symptoms in a broad non-clinical population (Burg & Michalak, 2011). The original CES-D was reported of having high reliability ($\alpha = .80-.90$). In this study we used the Hebrew version of the CES-D, translated by Zohar, Kleinman, and Dugma (2007). The Hebrew version of the CES-D had excellent reliability (Cronbach's $\alpha = .90$).

RESULTS

We first tested for intercorrelations between the indices of rumination and depressive symptoms. Table 1 displays the Pearson correlation coefficients. As expected, significant negative correlations between rumination and depressive symptoms and the number of meditation practicing months emerged. Namely, in accordance with the first hypothesis, participants who practiced meditation for a longer period of time reported less rumination and less depressive symptoms.

Table 1. Pearson's correlations between meditation measures, rumination, depressive symptoms and age.

	Rumination	Depressive symptoms	Practice		
			Months	Weekly	Daily minutes
Depressive symptoms	.55**				
Months of practice	.33**	.39**			
No. of weekly practices	-.19	-.27*	.38**		
Minutes of daily practice	-.29*	-.19	.28**	.32*	
Age	.31**	-.24**	.17	.03	.08

* $p < .05$ ** $p < .01$

The second hypothesis asserted that meditators experience less ruminative thinking and depressive symptoms than non-meditators. The hypothesis was examined using T-Tests for independent sample; the dependent variable were depressive symptoms and ruminative thinking and the independent variable was meditation. The hypothesis was partially confirmed; meditators experience significantly less ruminative thinking ($M=1.60$, $SD=0.38$) than non-meditators ($M=1.68$, $SD=0.45$) ($t_{(148)}=-3.45$, $p < 0.01$), but such differences between meditators ($M=3.54$, $SD=0.73$) and non-meditators ($M=3.12$, $SD=0.72$) were not found when it came to depressive symptoms.

In accordance with previous research which contends that there is a marked difference between meditators who persistently meditate to those who meditate infrequently, we divided the sample into three groups: non-meditators ($n=87$), light-meditators ($n=47$) and persistent-meditators ($n=16$). Criteria for each group was formed after consultation with a master of meditation studies in a prominent college. The criteria for the persistent-meditators group were practicing meditation over a year and a half, over four times a week, and having practice sessions of at least 10 minutes. Accordingly, the light-meditators group did not answer one or more of these criteria.

We hypothesized that persistent-meditators would have less rumination and depressed symptoms than the other two groups. In order to examine this hypothesis we performed a one-way ANOVA; we found a difference between the three groups in ruminative thinking but not in depressive symptoms. Non-meditators were highest in rumination ($M=3.54$, $SD=0.73$), followed by the light-meditators ($M=3.27$, $SD=0.69$). The persistent-meditators had the lowest ruminative thinking ($M=2.68$, $SD=0.66$; $F_{(2,147)}=10.41$, $p < .001$). Post hoc tests revealed significant differences both between the two groups of meditators and between the non-meditators and the persistent-meditators.

Our third hypothesis asserted that the meditation measures (months of practice, average number of practice sessions a week, and average minutes per practice session) and ruminative thinking would negatively predict depressive symptoms. In order to examine this hypothesis we built a regression model where the dependent variable was depressive symptoms and the independent variables were meditation measures and ruminative thinking. The overall model was significant ($F_{(5,57)}=5.41$, $p < .01$). Ruminative thinking significantly predicted depressive symptoms ($\beta=.39$, $p < .01$), but the other meditation indices did not.

Finally we examined the hypothesis that the relationship between ruminative thinking and depressive symptoms would be stronger among non-meditators than among meditators. As expected, the relationship between ruminative thinking and depressive symptoms was positive, significant and stronger among non-meditators ($r=0.59$, p

<.001) than among meditators ($r= 0.48, p <.001$). However, Fisher r-to-z transformation determined that the difference between the correlations was not significant so the hypothesis was not confirmed.

DISCUSSION

The aim of this study was to examine the correlation between ruminative thinking and depressive symptoms in a non-clinical sample, and to observe how the differences between meditators and non-meditators manifests in this context. This current study was based on previous psychological studies which found that practicing meditation contributes to the reduction of ruminative thinking; at the same time, ruminative thinking received growing attention in the scientific literature as an additional risk factor for depression.

Our first hypothesis was that as meditators practice meditation for a longer period of time, they will experience less ruminative thinking and depressive symptoms. This hypothesis was confirmed; a significant negative correlation was found between the months of meditation practice and ruminative thinking and depressive symptoms. This finding is consistent with results found in previous studies, showing that Mindfulness meditation practice leads to a decrease in ruminative thinking and depressive symptoms. Other studies have also revealed an inverse correlation between the level of the ability to remain attentive to breaths and between measures of ruminative thinking (Burg & Michalak, 2011) and have shown that Mindfulness meditation practice leads to a decrease in ruminative thinking (Ramel *et al.*, 2004). Further research indicates negative correlations between Mindfulness and ruminative thinking and depression (Burg & Michalak, 2011). Namely in accordance with the first hypothesis, the longer practitioners meditate, the less ruminative thinking and depressive symptoms they exhibit.

Our second hypothesis asserted that meditators would experience less ruminative thinking and depressive symptoms compared to non-meditators. This hypothesis was strengthened by a previous study that compared meditation course participants with a control group who had never practiced meditation, and found that among the course participants, there was a sharp decline in depression, a decrease in ruminative thinking and increased Mindfulness, when compared to the control group (Kemeny *et al.*, 2012). The current findings of this study suggest that the second hypothesis was partially confirmed; We found that meditators experience less ruminative thinking than non-meditators, but no such differences were found in depressive symptoms.

The difference between Kemeny *et al's* (2012) results and the findings in the present study may stem from the different nature of the sample used in each study: In contrast with their study, that examined participants in an intense meditation course, the present study examined participants who integrate meditation practice independently into their everyday life, and who do so in different and various quantities. In addition, the sample in this study included a non-clinical population which led to the depressive symptom scores being lower to begin with. This may be another reason that influenced the lack of statistical significance of the differences in depression scores.

Our third hypothesis claimed the correlation between ruminative thinking and depressive symptoms would be positive and stronger among non-meditators than in

meditators. This hypothesis was based on Nolan-Hoeksema's response styles theory; According to this theory the way in which individuals respond to symptoms of depression is related to the duration of those symptoms. For example, a response involving ruminative thinking might prolong the duration of depressive symptoms. Research supporting the theory found that high levels of ruminative thinking are related to higher levels of depressive symptoms (Grassia & Gibb, 2008). Another study found that the successful outcomes of the use of meditation in depression treatment were achieved by reducing ruminative thinking tendencies (Ramel *et al.*, 2004). The present study found the correlation between ruminative thinking and depressive symptoms to be positive, significant and stronger among non-meditators than among meditators. Even so, the difference between the correlations was not significant and thus the hypothesis was not fully confirmed.

Previous research suggests that non-adaptive behavior might result from different problems in the relations between emotions, cognitions and behavior (Izard & Schwartz, 1986). Izard and Schwartz's (1986) study tested whether depressive symptoms could be predicted by integrating emotional, cognitive and behavioral variables. They found that while emotional variables predicted the bulk of the variance of depressive symptoms, behavioral variables made a smaller contribution. Cognitive variables were found to have the least contribution in predicting depressive symptoms and the researchers claimed that automatic non-functional thoughts (the cognitive variable they chose to examine) can cater vulnerability to depression but not predict it (Carey, Carey, & Kelley, 1997). Therefore, it is possible that the third hypothesis was not supported in the current study because the study focused primarily on the cognitive part of depression and did not test for its other elements (emotional or behavioral).

Our fourth hypothesis asserted that meditation measures (months of practice, average number of practice sessions a week, and average minutes per practice session) and ruminative thinking would negatively predict depressive symptoms. The results indicate that ruminative thinking predicts depressive symptoms but meditation measures were not found to predict depressive symptoms. In fact, a previous study suggests that the success of the use of meditation to assist in treating depression is achieved by reducing ruminative thinking tendencies (Ramel *et al.*, 2004); i.e. reducing ruminative thinking is what helps relieving depressive episodes and not meditation directly, although meditation was found to be an effective tool in reducing ruminative thinking. In order to compare the ruminative thinking and depressive symptoms among the various meditation groups, we divided the sample into three groups: Non-meditators, light-meditators and persistent-meditators. In alliance with this understanding, we found a significant difference between the three groups in ruminative thinking but not in depressive symptoms.

Non-meditators were highest in rumination, followed by light-meditators. Persistent-meditators were lowest in ruminative thinking. The significant difference that was found between light-meditators and persistent-meditators emphasizes the importance of the persistence of the meditation practice, in accordance with the first finding of this study. In addition, the difference between the non-meditators and the persistent-meditators, indicate the efficacy of meditation in reducing ruminative thinking, as found throughout this study and in broad literature on this subject.

This study should take into account its limitations. First, this is a preliminary study and the hypotheses were mostly exploratory. Second, this was a community based study with a large number of people approached who eventually did not agree to participate. This was probably due to the fact that they were not meditators. Further research should try to reach a broader range of participants, including those whom meditation does not particularly interest. Nonetheless, this study contributes to the growing field of psychology and meditation. This study suggests positive effects of meditation on well-being in a non-clinical population. Future researches should also examine other elements of depression, such as behavioral, emotional and cognitive aspects.

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