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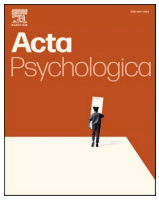

Exploratory study of the effects of multi-site mindfulness interventions on the multifaceted self as a psychosocial indicator of mental health: A pilot study

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ABSTRACT

The multifaceted self refers to how non-clinical individuals perceive themselves as possessing a more sophisticated self-compared to others by accumulating pairs of opposing positive traits. Conversely, depressed individuals are more multifaceted on negative traits, revealing an absence of self-enhancement strategies, which are known to be associated with psychological adjustment. A pre−/post-intervention study was conducted to observe the changes in multifaceted self and mental health following an 8-week multi-site Mindfulness-Based Interventions (MBIs) targeting depression and anxiety disorders. Among the 24 participants, changes occurred across all outcome measures (i.e., trait mindfulness, anxiety, depression and self-compassion). Participants displayed reduced self-negativity, a more positive view of others, and although they still maintained a more negative self-view compared to their view of others, this improved with the MBIs. Mindfulness and social comparison processes are discussed. The multifaceted self serves as a relevant methodological approach to assess mental health adjustment in MBIs.

1. Introduction

The multifaceted self is a psychosocial concept corresponding to the individual's perception of possessing more opposing pairs of traits (e.g., cautious and bold) than are attributed to others, hence claiming a richer and more adaptative self when it comes to positive traits (Sande, 1988). This is understood as a form of self-enhancement relative to others (Cheung et al., 2014). As for negative traits, the number of traits ascribed to oneself does not differ from the number ascribed to others, although disliked others are attributed more undesirable traits than are liked others (Locke & Horowitz, 1997). Compared with non-depressed individuals, depressed ones are more multifaceted in terms of undesirable traits, and less multifaceted in desirable traits; they also tend to assess themselves and others equally (Locke & Horowitz, 1997). Depressed individuals thus display less self-enhancement and more self-criticism, which are also predominant processes in anxiety or stress disorders (Alicke & Sedikides, 2009). Self-compassion, i.e., treating oneself with warmth and understanding rather than self-criticism (Neff & Dahm, 2015), is an important factor in reducing these disorders (Frostadottir & Dorjee, 2019; MacBeth & Gumley, 2012). The study of mindfulness-based interventions (MBIs) is of growing interest due to their demonstrated efficacy in addressing a wide range of psychological and physiological conditions. MBIs have exhibited significant benefits in reducing symptoms of anxiety, depression, and stress, as well as in enhancing emotional regulation and overall well-being (Crane et al., 2023; Fumero et al., 2020; Hofmann et al., 2010; Hofmann & Gómez, 2017; Moreno-Jiménez et al., 2021; Reangsing et al., 2023), including through fostering self-compassion (Wilson et al., 2019) and changing one's perspective on the self (Hölzel et al., 2011). These interventions are rooted in evidence-based practices that cultivate mindfulness, defined as nonjudgmental awareness of the present moment (Kabat-Zinn, 2023), which has been linked to improved mental health outcomes and resilience.

As non-pathological forms of self-enhancement are related to better psychological adjustment (Dufner et al., 2019), the present study proposes using the multifaceted self as a methodological and psychosocial approach to measuring the effects of MBIs on anxiety and depression disorders and to updating theoretical groundings in specific intervention

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settings such as MBIs. Interestingly, to our knowledge, the multifaceted self has not yet been studied in relation to mindfulness, despite having been explored in the context of depression. As a conceptual framework capable of shedding light on processes of self-evaluation, social comparison, and psychological adjustment—processes that mindfulness has been shown to influence (for a comprehensive review, see Britton et al., 2021)—the multifaceted self could be a valuable psychosocial tool in psychological interventions. The question of whether the multifaceted self can provide a psychosocial perspective on the clinical effects of mindfulness constitutes the research gap this pilot study aims to address. The primary objective of this study is thus to explore the effects of MBIs on the multifaceted self.

We hypothesized that, following the MBIs and compared with pre-intervention, the participants would attribute more positive traits and fewer negative traits to themselves, and would not perceive themselves differently from others.

2. Method

2.1. Participants

Participants were recruited through hospital and clinician referrals in a large city in France. Inclusion criteria required a diagnosis of stress and/or anxiety-depressive disorders by the referring psychiatrist. Exclusion criteria included failure to complete the eight sessions of the MBI (i.e., mindfulness-based stress reduction [MBSR] or mindfulness-based cognitive therapy [MBCT])[1] and having baseline anxiety and depression scores up to the cutoff score of 11 (see Tanaka et al., 2024; Uhlenbruch et al., 2024). Six MBI groups were conducted between May 2022 and May 2023, involving a total of 68 participants. These groups were facilitated by ten different clinical psychologists and psychotherapists, with a minimum of two co-facilitators per session. Because part of the questionnaire was optional, because of the elevated attrition rates often observed in MBIs—ranging from 15.5 % to 29 % (Goldberg et al., 2020) and even reaching up to 80 % in some cases (Khoury et al., 2013)—and because of the average attrition rate of 10 % commonly reported for online surveys (Ward et al., 2017), only 24 participants from the original cohort of 68 completed both the pre-intervention and post-intervention questionnaires. This corresponds to a dropout rate of 64.7 %. The 24 participants were on average 44.1 years old ($SD = 15.3$), 21 were females, 16 had a professional activity, and 85 % had at least a bachelor's degree.

2.2. Procedure

Participants provided written consent with their signature. The study was approved by the Human Research Ethics Committee Ile de France XI number 21.04604.000058 – 22012. The MBI instructors based at multiple sites shared the online survey link at the information session preceding the start of the protocol (Time 1), and then again at the end of the protocol (Time 2).

Mindfulness-based interventions (MBIs) encompass a broader range of therapeutic approaches than just MBSR or MBCT protocols. MBIs such as mindful self-compassion (MSC) and trauma-sensitive mindfulness integrate mindfulness practices to address various psychological, medical, and educational challenges, including anxiety, depression, chronic pain, eating disorders, and addiction (Fuchs et al., 2013; Hofmann & Gómez, 2017). These interventions often combine mindfulness with other therapeutic frameworks to enhance their effectiveness. For instance, MBCT integrates mindfulness practices with cognitive–behavioral therapy (CBT) techniques to prevent the relapse of depression. Similarly, dialectical behavior therapy (DBT) incorporates mindfulness to help individuals develop specific skills such as emotional regulation. The theoretical foundations of MBIs are adapted to align with the specific goals of each intervention, ensuring a tailored approach to meet diverse patient needs. The specific content of our MBI sessions is available as Supplementary Material_Pilot Study at the following link: doi:https://doi.org/10.6084/m9.figshare.28282619. In our research, the program structures were consistent in terms of duration and frequency; however, not all instructors were certified as MBSR practitioners, despite possessing relevant clinical training. Consequently, we have refrained from exclusively citing the MBCT-MBSR labeling of practices in this manuscript.

2.3. Measures

To assess the MBIs' effects on the multifaceted self, we created four pairs of opposing positive and negative traits. The participants had to choose one of the four options for each, for example, “I am: 1) energetic, 2) calm, 3) neither, 4) both” and “I am: 1) withdrawn, 2) overwhelming (outgoing), 3) both, 4) neither.” The same items were presented for the multifaceted “other” defined as a meditator, for example, “A meditator is: 1) energetic, 2) calm, 3) neither, 4) both.” Mindfulness was measured by the Mindful Attention Awareness Scale (MAAS) ($\omega_{T1} = 0.94$; $\omega_{T2} = 0.89$), while self-compassion was measured by the Self-Kindness and Self-Judgment subscales of the Self-Compassion Scale (SCS) ($\omega_{T1} = 0.78$; $\omega_{T2} = 0.76$). Mental health issues such as anxiety and depression were measured by the Hospital Anxiety Depression Scale (HADS) ($\omega_{T1} = 0.80$; $\omega_{T2} = 0.83$). Paired-sample *t*-tests were conducted to examine differences between pre- and post-intervention time points (see Tables 1a and 1b).

3. Results

As expected, mindfulness ($t[23] = -3.78$, $p < .001$, $d = -0.77$) and self-compassion ($t[23] = -2.71$, $p = .013$, $d = -0.55$) increased from pre- to post-intervention, whereas anxiety and depression decreased ($t[23] = 5.59$, $p < .001$, $d = 1.14$). For the multifaceted self, compared with pre-intervention, participants more often ascribed themselves “neither negative trait” post-intervention ($t[23] = -4.10$, $p < .001$, $d = -0.84$). Post-intervention, they more often ascribed “both positive traits” to others ($t[23] = -2.12$, $p = .045$, $d = -0.43$). Pre-intervention, they more often ascribed “both negative traits” to themselves than to others ($t[23] = 2.80$, $p = .010$, $d = 0.57$) and less often ascribed “neither negative trait” to themselves than to others ($t[23] = -6.04$, $p < .001$, $d = -1.23$). Post-intervention, the results were similar for “both negative traits” ($t[23] = 2.39$, $p = .026$, $d = 0.48$) and “neither negative trait” ($t[23] = -5.82$, $p < .001$, $d = -1.19$), although the pre- to post-intervention difference for the later comparison was significant ($t[23] = 2.70$, $p = .013$, $d = 0.55$).

4. Discussion

The findings provide evidence for the efficacy of MBIs in fostering positive psychological change. As expected, participants exhibited significant increases in mindfulness and self-compassion, accompanied by reductions in anxiety and depression. These results align with prior research on the psychological benefits of MBIs (Shapiro et al., 2006).

The observed improvement in self-perception, particularly the reduction in ascribed negative traits, highlights the role of MBIs in promoting a less negative self-concept. This supports the notion of disidentification from maladaptive self-concepts as a core mindfulness process (Shapiro et al., 2006). Participants' increased tendency to ascribe positive traits to others post-intervention suggests a shift toward more balanced social appraisals, which may enhance interpersonal dynamics and social connectedness, consistent with the literature showing

[1] No statistical analyses were conducted when comparing the MBSR and MBCT patients because the sample size was too small and most active elements of both protocols were similar (i.e., acceptance, non-reactivity, and meditation training; see Stein & Witkiewitz, 2020).

Table 1a
Descriptive statistics and paired-sample *t*-test results comparing pre- and post-intervention time points.

Scale	Pre-intervention, mean (*SD*)	Post-intervention, mean (*SD*)	*t*	*p*	*d*
MAAS	3.46 (0.76)	4.11 (0.86)	−3.78	<0.001	−0.77
HADS	2.31 (0.45)	1.93 (0.42)	5.59	<0.001	1.14
SCS	3.19 (0.79)	3.64 (0.76)	−2.71	0.013	−0.55
Multifaceted Self positive "both"	1.54 (1.22)	1.75 (1.45)	−0.95	0.350	−0.20
Multifaceted Self positive "neither"	0.38 (0.71)	0.42 (0.83)	−0.20	0.847	−0.04
Multifaceted Self positive "one of two"	2.08 (1.06)	1.83 (1.24)	1.03	0.314	0.21
Multifaceted Self negative "both"	0.750 (1.11)	0.42 (0.72)	2.00	0.057	0.41
Multifaceted Self negative "neither"	2.21 (1.22)	2.96 (0.86)	−4.10	<0.001	−0.84
Multifaceted Self negative "one of two"	1.04 (1.04)	0.63 (0.77)	2.46	0.022	0.50
Multifaceted Other positive "both"	1.33 (1.13)	1.88 (1.39)	−2.12	0.045	−0.43
Multifaceted Other positive "neither"	0.54 (0.98)	0.58 (0.83)	−0.20	0.840	−0.04
Multifaceted Other positive "one of two"	2.13 (1.19)	1.54 (1.02)	2.23	0.036	0.45
Multifaceted Other negative "both"	0.08 (0.41)	0.04 (0.20)	1.00	0.328	0.20
Multifaceted Other negative "neither"	3.75 (0.68)	3.92 (0.28)	−1.45	0.162	−0.30
Multifaceted Other negative "one of two"	0.17 (0.38)	0.04 (0.20)	1.37	0.185	0.28

Note. MAAS: Mindfulness Awareness Attention Scale; HADS: Hospital Anxiety and Depression Scale; SC: Self-Compassion Scale; Multifaceted Self: when the participants responded about themselves; Multifaceted Other: when the participants responded about others we defined as "meditators"; "both": both traits; "neither": neither trait; "one of two": one of the two traits presented.

Table 1b
Paired-sample *t*-test results comparing the Multifaceted Self with the Multifaceted Other.

Pre-intervention		*t*	*p*	*d*
Multifaceted Self positive "both"	Multifaceted Other positive "both"	0.79	0.435	0.16
Multifaceted Self positive "neither"	Multifaceted Other positive "neither"	−0.66	0.517	−0.13
Multifaceted Self positive "one of two"	Multifaceted Other positive "one of two"	−0.14	0.894	−0.03
Multifaceted Self negative "both"	Multifaceted Other negative "both"	2.80	0.010	0.57
Multifaceted Self negative "neither"	Multifaceted Other negative "neither"	−6.04	<0.001	−1.23
Multifaceted Self negative "one of two"	Multifaceted Other negative "one of two"	4.14	<0.001	0.85
Post-intervention				
Multifaceted Self positive "both"	Multifaceted Other positive "both"	−0.38	0.709	−0.08
Multifaceted Self positive "neither"	Multifaceted Other positive "neither"	−0.78	0.445	−0.16
Multifaceted Self positive "one of two"	Multifaceted Other positive "one of two"	1.13	0.271	0.23
Multifaceted Self negative "both"	Multifaceted Other negative "both"	2.39	0.026	0.49
Multifaceted Self negative "neither"	Multifaceted Other negative "neither"	−5.82	<0.001	−1.19
Multifaceted Self negative "one of two"	Multifaceted Other negative "one of two"	3.44	0.002	0.70

Note. Multifaceted Self: when the participants responded about themselves; Multifaceted Other: when the participants responded about others we defined as "meditators"; "both": both traits; "neither": neither trait; "one of two": one of the two traits presented.

that mindfulness practices, for example, enhance the sense of belonging (Hashemzadeh et al., 2022; Russo, 2019) and reduce perceived loneliness (Lindsay et al., 2019; Teoh et al., 2021). Nevertheless, the persistence of a more negative self-image relative to the perception of others indicates that while MBIs may initiate a positive shift in self-perception, additional work may be required to fully address upward social comparison tendencies. The findings are consistent with McCarthy and Morina (2020), who demonstrated that reducing upward social comparisons is critical for improving mental health outcomes. Other evidence-based psychotherapies and interventions could be integrated into MBIs to enhance their effectiveness in addressing upward social comparison. First, CBT could target maladaptive thought patterns by challenging unrealistic beliefs and reframing negative thoughts. McCarthy and Morina (2020) have demonstrated that interventions focused on reinterpreting social comparisons significantly reduce their harmful effects and improve mental health outcomes. By applying Lyubomirsky et al.'s (2006) suggestion to incorporate psychoeducational interventions that enhance self-awareness and foster emotional resilience, reducing the negative impact of upward comparisons on mental health, CBT interventions could complement MBIs with a specific focus on these aspects of upward social comparisons.

Programs such as mindful self-compassion (MSC), which focus on cultivating kindness toward oneself, especially at moments of perceived failure or inadequacy, would reduce self-critical tendencies and harsh self-judgments that often arise from social comparisons (Neff, 2011), promoting healthier self-worth and emotional resilience. Emmons and McCullough (2003) demonstrated that regular gratitude practices enhance psychological well-being and mitigate the adverse effects of social comparison.

Acceptance and commitment therapy (ACT) promotes the acceptance of thoughts and emotions without judgment, shifting attention away from unproductive comparisons and toward personal growth and meaningful goals (Hayes et al., 2006). Another element that could be controlled during the intervention is the use of social media. Future interventions could include strategies such as limiting exposure to social media platforms, curating positive and supportive content, and implementing "digital detox" practices. Meier and Schäfer (2018) highlighted that reducing exposure to idealized content on social media significantly alleviates comparison-based distress.

Overall, this study underscores the importance of the multifaceted self as a psychosocial indicator of mental health improvement. By demonstrating that MBIs can cultivate a less negative self-image, this research provides insight into a critical mechanism of psychological adjustment. Furthermore, the results highlight the value of considering psychosocial constructs when evaluating MBI outcomes, as they reflect deeper shifts in self-concept and interpersonal perception that are pivotal for long-term mental health and resilience (Humberg et al., 2019).

Despite its promising findings, this study has some potential limitations. First, the sample size ($n = 24$) was relatively small, which may

limit the generalizability of the results to broader populations. Future studies should replicate the present findings with larger and more diverse samples to confirm the robustness of the effects observed. Second, the absence of a control group limits the ability to attribute the observed changes exclusively to the MBI. The results may have been influenced by external factors, such as natural improvements over time or participation in a supportive group setting. Including a randomized controlled trial design would strengthen causal inferences about the effects of MBIs. Finally, the reliance on self-report measures introduces the possibility of response bias, as participants may have been motivated to present themselves in a more favorable light post-intervention. Incorporating objective or observer-based measures would complement the self-reported data and enhance the validity of the findings.

5. Future directions/conclusion

Future research investigating the role of potential mediators, such as reduced rumination, enhanced emotional regulation, and increased perspective-taking, could elucidate the mechanisms underlying the observed changes in self-perception. Moreover, longitudinal studies are needed to assess the sustainability of the benefits observed post-intervention and whether these changes translate into broader improvements in life functioning and resilience.

Finally, integrating qualitative methodologies, such as participant interviews and focus groups, may provide richer insights into the subjective experiences of change during MBIs. This approach could shed light on subtle yet meaningful shifts in self-concept and interpersonal dynamics that quantitative measures may not fully capture. By addressing these directions, future research could advance the understanding and application of MBIs as powerful tools for fostering psychological well-being and positive self-perception.

CRediT authorship contribution statement

Philippine Chachignon: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Emmanuelle Le Barbenchon:** Writing – review & editing, Visualization, Validation, Supervision, Project administration, Conceptualization. **Lionel Dany:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization. **Sylvia Martin:** Writing – review & editing, Supervision, Software, Resources, Project administration, Methodology, Conceptualization.

Ethical statement

Ethical approval has been granted under the reference Human Research Ethics Committee Ile de France XI number 21.04604.000058 – 22012. The domestic regulations follow Helsinki's recommendations.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors utilized ChatGPT to enhance language clarity and fluency. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Declaration of competing interest

The Authors declare having no conflict of interest.

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Data availability

Data will be available on a repository at the following link: doi: https://doi.org/10.6084/m9.figshare.25420708.v1.

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