

## Original

## Short-term effects and adherence to the practice of different meditation modalities in mindfulness-based interventions

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## A B S T R A C T

*Antecedents:* Previous research has distinguished between mindfulness practices, specifically focused-attention meditation and open-monitoring meditation, noting that the different modalities appear to impact medium- and long-term benefits. However, understanding their distinct effects in the very short term is also crucial, as it may elucidate some of the adherence issues. *Objectives:* This study aims to examine the short-term effects of various meditation practices that differ in attentional focus and stimuli among novices. The focus is on immediate affect, perceived difficulty, and adherence. *Method:* A randomized controlled within-subject design with pretest and posttest measures was employed in a workshop consisting of four sessions (four weekly sessions of 1 hour each). Four experimental conditions were established: Internal and Focused (I-FA, Internal Focused-attention), External and Focused (E-FA, External Focused-attention), Internal and Open (I-OM, Internal Open monitoring), and External and Open (E-OM, External Open monitoring). *Results:* The E-OM modality demonstrated a more significant reduction in discomfort compared to the I-OM modality. Participants reported higher difficulty in meditating on external stimuli compared to internal stimuli, irrespective of whether the meditation was focused or open. However, at least in this study, the modality type did not seem to influence adherence to the meditation practice. *Conclusions:* The findings suggest the importance of further investigating E-OM meditation as an alternative to I-OM at the beginning of mindfulness training.

### Efectos a corto plazo y adherencia en la práctica de diferentes modalidades de meditación en intervenciones basadas en mindfulness

## R E S U M E N

*Antecedentes:* Investigaciones previas han diferenciado entre prácticas de mindfulness, específicamente la meditación de atención focalizada y la meditación de monitoreo abierto, señalando que las diferentes modalidades parecen tener impactos en beneficios a medio y largo plazo. Sin embargo, comprender sus efectos diferenciales a nivel anímico también es crucial, ya que puede arrojar luz sobre algunos problemas de adherencia. *Objetivos:* Este estudio tiene como objetivo examinar los efectos a corto plazo de diversas prácticas de meditación que difieren en el enfoque de la atención y los estímulos entre los principiantes. El enfoque se centra en el afecto inmediato, la dificultad percibida y la adherencia. *Método:* Se empleó un diseño controlado aleatorio dentro de sujetos con medidas pre y post en un taller que constaba de cuatro sesiones (cuatro sesiones semanales de 1 hora cada una). Se establecieron cuatro condiciones experimentales: Interna y Focalizada (I-FA, Atención focalizada interna), Externa y Focalizada (E-FA, Atención focalizada externa), Interna y Abierta (I-OM, Monitoreo abierto interno), y Externa y Abierta (E-OM, Monitoreo abierto externo). *Resultados:* La modalidad E-OM demostró una reducción más significativa en la incomodidad en comparación con la modalidad I-OM. Los participantes informaron mayor dificultad al meditar con estímulos externos en comparación con estímulos internos, independientemente de si la meditación era focalizada o abierta. Sin embargo, al menos en este estudio, el tipo de modalidad no pareció influir en la adherencia a la práctica de meditación. *Conclusiones:* Los hallazgos sugieren la importancia de investigar las potenciales ventajas de incluir la meditación E-OM como alternativa a I-OM en el comienzo del entrenamiento en mindfulness.

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## Introduction

Mindfulness, initially translated by [Hanh \(1975\)](#) as full attention practiced through meditation, is currently defined as complete attention to reality, in the present moment, without judgment and with acceptance ([Kabat-Zinn, 1990](#); [Vásquez-Dextre, 2016](#)). According to [Bishop et al. \(2004\)](#), contemporary psychology embraces mindfulness as a technique to enhance awareness and respond adaptively to mental processes leading to psychopathological disorders and behavioral problems.

The most established Mindfulness-Based Interventions (MBI) protocols, from which all others derive, include [Kabat-Zinn's \(1990\)](#) Mindfulness-Based Stress Reduction (MBSR) and [Segal et al.'s \(2013\)](#) Mindfulness-Based Cognitive Therapy (MBCT) for depression treatment. MBI has demonstrated effectiveness in improving various biopsychosocial conditions such as anxiety, insomnia, addiction, psychosis, pain, hypertension, weight control, cancer-related symptoms, and prosocial behaviors like empathy and compassion ([Zhang et al., 2021](#)), emotional self-regulation, positive emotions, and general mental health ([Galante et al., 2021](#)).

While researchers historically classified meditation types by geographical or historical origin, more contemporary analyses focus on the involved processes. [Delmont \(1987\)](#) proposed three variants based on attentional psychological processes: 1) observation of the entire global field and the mental process (open monitoring), 2) focusing restrictively on a specific support (focalization), and 3) the integration or alternation of both methods, as seen in Zen and transcendental meditation.

[Vago and Silbersweig \(2012\)](#) suggest classifying MBI meditations into three types: focused attention meditation (FA) on a specific event, whether external or internal; open monitoring meditation (OM), broadening focus to the entire experience; and compassion meditation (Loving Kindness Meditation, LKM), which differs by focusing on enhancing compassion and self-compassion through guided imagery. The original mindfulness protocol by [Kabat-Zinn \(1990\)](#) begins with FA on breathing, progresses to OM, and finally includes LKM. This sequence, first FA and then OM, is intentional, reflecting the “mental calm” resulting from strengthened attention after FA, considered essential for correct OM understanding and execution (e.g., [Galve, 2013](#)).

Research comparing the impact of different meditation practices suggests fruitful avenues for future exploration. Modalities may have varying effects on mood or different cognitive/emotional benefits ([Cebolla et al., 2017](#)). For example, [Cahn and Polich \(2006\)](#) and [Lutz et al. \(2008\)](#) found that OM meditators exhibit better sustained attention in the face of unexpected stimuli than FA meditators. [Lippelt et al. \(2014\)](#) noted neural activity differences, with FA associated with increased activity in the right dorsolateral prefrontal cortex (dlPFC) related to sustained attention, and OM activating the anterior cingulate cortex, a self-regulation structure. Additionally, FA improved convergent thinking, while OM enhanced divergent thinking and creativity. [Yordanova et al. \(2020\)](#) found improved beta coherence lateralized to the left hemisphere in OM and to the right hemisphere in FA, suggesting that open meditation enhances bottom-up processes and attentional focus favors top-down metacognitive processes.

Different meditation modalities may have varying effects on medium- and long-term benefits, but understanding their short-term effects is crucial for explaining adherence problems. Specifically, we will review research exploring differential outcomes when meditation is focused on an internal stimulus (I-FA, Internal-Focused Attention) or external stimulus (E-FA, External-Focused Attention).

[Feruglio et al. \(2021\)](#) highlight a specific effect of I-FA compared to I-OM: the reduction of rumination and the promotion of a positive

emotional state. This emphasizes the importance of focusing on the quantity and quality of meditation for understanding its effectiveness and adherence ([Hassed et al., 2021](#)). [Goldberg et al. \(2020\)](#) suggest that the quality of practice acts as a mechanism linking practice time and benefits obtained. However, more than half of meditators (56.6%) report that falling asleep poses a significant challenge, and interestingly, drowsiness is more frequent in I-OM (67.57%) than in I-FA (23.19%) ([Birtwell et al., 2019](#)). Objective measures, such as heart rate and cortisol secretion, reveal that after 30 minutes of guided meditation, I-FA generates more physiological relaxation, while I-OM increases physiological arousal but reduces arousal stress ([Ooishi et al., 2021](#)).

The effectiveness of Mindfulness-Based Interventions (MBIs) depends on adherence to practices, and recent studies have examined factors influencing adherence in novice mindfulness practitioners ([Horrillo-Álvarez et al., 2019](#)). [Forbes et al. \(2018\)](#) found that three factors predicted higher adherence: level of motivation, trait conscientiousness, and trait mindfulness. [Ribeiro et al. \(2018\)](#) examined the duration and frequency of different mindfulness practices in adult novices, finding that OM and FA were the more practiced mindfulness modalities. The reasons for differences in adherence are not fully understood, but some research suggests that individual preferences and personality may play a role.

In addition to the usual distinctions between focused attention and open monitoring, we will include conditions based on the use of both internal (e.g., breathing) and external (e.g., sounds, other sensory stimuli) stimuli, as these have been little studied in previous literature. For example, although overt monitoring of internal stimuli (i.e., body scan) may generate less calm by promoting awareness of less pleasant emotions and thoughts ([Sedlmeier et al., 2018](#)), this may lead to the opposite outcome if open monitoring is focused on environmental stimuli. However, this modality has rarely been directly compared to other strategies.

The goal of this paper is to systematically study the impact of four meditation modalities (Focused vs. Open, internal vs. external) on immediate affect, perceived difficulty, and adherence. [Forbes et al. \(2018\)](#) found that the number and severity of obstacles did not predict adherence. Activities are often emotionally driven, so we gathered various indicators of emotional reactions reported by participants after learning each meditation modality. Reduced self-efficacy can be both an obstacle and a stimulus for meditation practice, so we also evaluated the perceived difficulty of each modality to predict its impact on motivation for practice ([Forbes et al., 2018](#)). A within-subjects study was conducted in which all participants were trained in each of the four modalities in consecutive weeks: Internal Stimulus Focused (I-FA, Internal/Focused Attention), External Stimulus Focused (E-FA, External/Focused Attention), Internal Stimulus Open Monitoring (I-OM), and open monitoring of external stimuli (E-OM, External/Open Monitoring). Each participant was assigned to a different entry point; some started with I-FA, others with E-FA, and so on.

Following the previous research reviewed above, we propose the following hypotheses:

1. The modality of internal focus on an internal stimulus (i.e., breathing) will generate greater well-being, less discomfort, and a greater time/frequency of practice than the modality of open monitoring of internal stimuli (i.e., body scan).

2. The modality of open monitoring of external stimuli (i.e., sounds, smells, etc.) will generate greater well-being and less discomfort and a greater time/frequency of practice than the modality of open monitoring of internal stimuli (i.e., body scan).

3. The internal modalities (I-FA and I-OM) will imply less difficulty in the short term and will be associated with a longer time/frequency of practice compared to the external modalities

**Table 1.**  
Mean and standard deviations of outcome variables for each of the within-groups conditions.

	Well-being Mean (SD)	Discomfort Mean (SD)	Difficulty Mean (SD)	Practice time Mean (SD)	Practice frequency Mean (SD)
Condition I-FA	21.9 (4.1)	5.9 (2.4)	6.3 (2.5)	60.4 (41.8)	4.7 (2.4)
Condition E-FA	20.8 (5.9)	6.1 (3.1)	7.2 (2.2)	55.8 (42.5)	4.4 (2.6)
Condition I-OM	20.8 (4.9)	6.4 (2.7)	6.5 (2.2)	56.3 (40.2)	4.4 (2.3)
Condition E-OM	22.0 (4.5)	5.3 (2.2)	7.2 (2.0)	63.8 (42.8)	4.8 (2.5)

(E-FA and E-OM).

## Method

### Participants

We recruited 96 participants (88.1% women, 11.9% men) with a mean age of 24.12 years ( $SD = 9.25$ ). 86.1% of the sample is between 18 and 30 years old. 72.3% had completed high school and 27.7% university ( $SD = 0.45$ ). We grouped them into 4 random conditions: condition 1, 16 participants; condition 2, 29; condition 3, 35 and condition 4, 16. Only 68 completed the workshop. We do not have information on the reasons for dropping out and there were no differences in the percentage of dropouts by condition.

### Instruments

**Questionnaire of Well-being and Discomfort Indicators:** This ad-hoc instrument comprises two dimensions. The well-being variable encompasses four items: satisfaction, perceived usefulness of the acquired knowledge, feelings of calm/serenity, and physical relaxation (Cronbach's Alpha: .76). Meanwhile, the discomfort variable includes three items: general discomfort, restlessness/urge to move, and feelings of being overwhelmed (Cronbach's Alpha: .74). Participants completed assessments of these variables after each meditation session.

**Adherence:** Adherence was quantified utilizing the Insight Timer mobile app, which records the frequency and total duration of meditation sessions between workshops (Insight Network Inc, 2020). This method aligns with previous research methodologies (Horriillo-Álvarez et al., 2019) to measure participants' engagement with the meditation practice.

### Design

A randomized controlled within-subject design was used with pre- post-test measurements through a 4-session "workshop" (4 weekly 2-hour sessions). Four categorization variables of mental techniques are established based on the training of attention in an Internal/External axis and another Focused/Open axis (open), generating 4 experimental conditions or levels of the independent variable (Meditation modalities) for which all participants will go through:

-Internal and Focused (I-FA, Internal Focused-attention): concentration maintained on the internal stimulus of breathing.

-External and Focused (E-FA, External Focused-attention): concentration maintained on the auditory stimulus of the monotonous sound of a water source.

-Internal and Open (I-OM, Internal Open monitoring): body scan and observation of the whole body as a whole.

-External and Open (E-OM, External Open monitoring): monitoring open to the entire experience: incense stimuli for smell and audio water source for sound.

### Procedure

This study received approval from the ethics committee of the Faculty of Psychology at the Complutense University of Madrid. Participants were recruited through mass emails and social media posts, inviting them to a free "Introduction to Meditation Mindfulness Workshop" at a Spanish university. A total of 182 university students, predominantly enrolled in Psychology courses, responded by completing a Google Forms questionnaire, indicating their preferred time slots. Based on availability, volunteers were selected to attend a preliminary session where they received detailed information about the study, including inclusion and exclusion criteria. Participants who remained interested provided their informed consent. The inclusion criterion was the absence of prior formal or ongoing experience in mindfulness, while the exclusion criterion encompassed any self-reported diagnosed psychopathologies and/or ongoing treatments that could potentially interfere with or exacerbate the intervention.

### Data analysis plan

For data analysis, an ANOVA with within-subjects factor (i.e., four modalities) is used. They are analyzed with the statistical program IBM SPSS Statistics 20.0. Compliance with the assumptions of normality, homoscedasticity and independence of the observations is verified through descriptive exploratory analysis.

## Results

Table 1 displays the mean and standard deviations of outcome variables for each within-group condition.

Statistical analyses revealed no statistically significant differences in general *well-being* reported in the post-session questionnaire across the different meditation modalities,  $F(3, 80) = 2.134, p = .102, \eta^2 = .074$  (see Figure 1).

However, concerning *discomfort*, significant differences were observed ( $F(3, 80) = 4.077, p = .010, \eta^2 = .133$ ). External open meditation (E-OM) was associated with the least level of discomfort, and the difference was significant when compared to the internal open meditation (I-OM) ( $p = .007$ ), and nonsignificant when compared with the focused modalities (I-FA,  $p = .365$ ; y E-FA,  $p = .280$ ), being (see Figure 2).

Regarding the *minutes* dedicated to each modality (see Figure 3) as an indicator of adherence, post-hoc comparisons did not reveal statistically significant differences ( $F(3, 97) = 2.921, p = .038, \eta^2 = .83$ ). There were no statistically significant differences for the *frequency* of the sessions of the different techniques in Figure 4 either ( $F(3, 84) = 1.776, p = .158, \eta^2 = .060$ ).

Statistically significant differences emerged in the perceived degree of *difficulty* ( $F(3, 80) = 3.909, p = .012, \eta^2 = .128$ ). Participants reported higher difficulty for the external modalities. Specifically we found statistically significant differences when compared I-FA to E-FA y E-OM ( $p = .008$  for both post-hoc), E-FA when

compared to I-OM ( $p = .018$ ) and I-OM when compared to E-OM ( $p = .024$ ).

in four distinct modalities. The objective was to comprehend preferences and, consequently, adherence to each meditation mode. Consequently, we assessed the effects of these modalities on changes in well-being, discomfort reported during initial practice, and perceived difficulty.

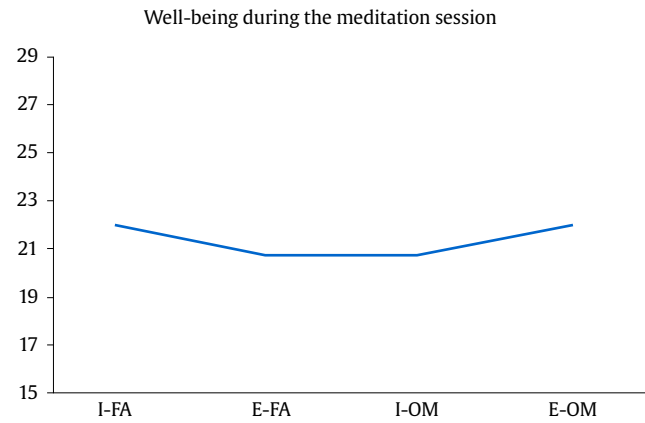


Figure 1

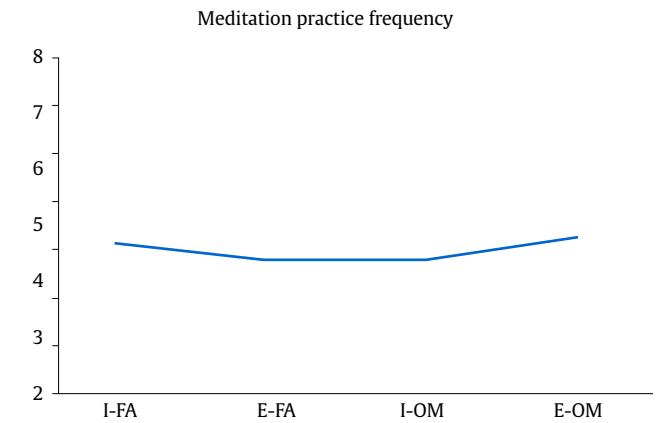


Figure 4

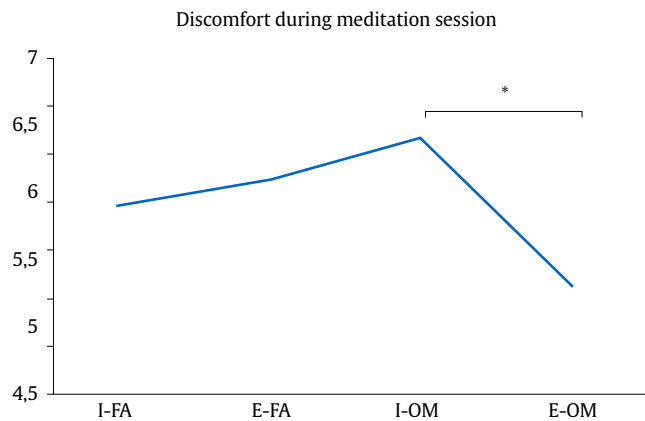


Figure 2

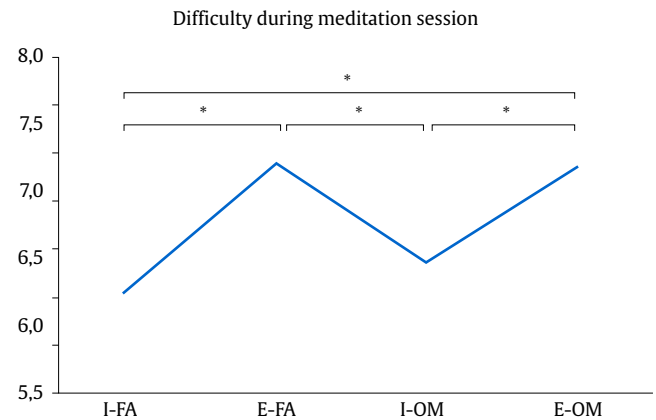


Figure 5

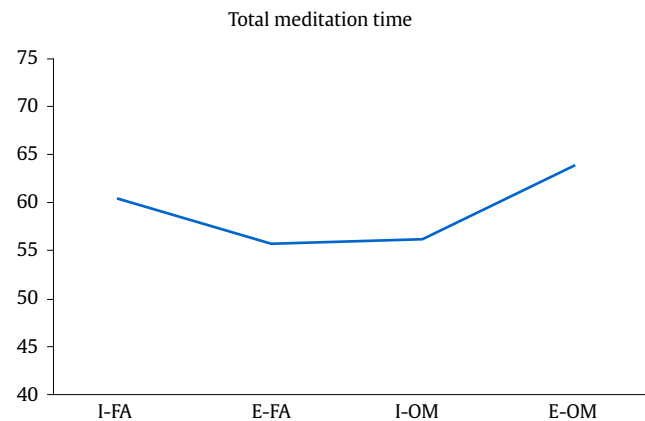


Figure 3

**Discussion**

The primary aim of this study was to investigate the short-term impacts of various meditation modalities on novice participants. We conducted an independent analysis of attentional focus (Focused vs. Open) and the type of stimulus (Internal vs. External), resulting

Hypothesis 1 suggested that the internal focused monitoring modality (I-FA) would yield greater short-term well-being and less discomfort than the open internal modality (I-OM). However, the results did not support this hypothesis, as these meditation modalities demonstrated similar levels of well-being and discomfort (refer to Figure 1 and Figure 2). No differences were observed in terms of time or frequency of practice.

Hypothesis 2 posited that the modality of open monitoring of external stimuli would generate greater well-being and less discomfort compared to the modality of open monitoring of internal stimuli. In this case, Hypothesis 2 was partially fulfilled. Figure 2 illustrates how the E-OM modality is associated with significantly lower discomfort levels than the I-OM modality. Nevertheless, no differences were noted in terms of well-being between these two modalities.

The variations in discomfort are particularly intriguing, suggesting that the E-OM condition may induce less discomfort than I-OM. Previous literature insufficiently emphasized the significance of specific contextual stimuli associated with the meditative process. While Kropp and Sedlmeier (2019) reported that body scanning (i.e., I-OM) is linked to the highest states of relaxation and well-being in the short term among the various modalities used in MBI, our study did not find greater well-being associated with I-OM.

However, it did reveal less discomfort in E-OM. This raises potential avenues for future research: firstly, whether E-OM, typically one of the least-used modalities in MBIs, merits further investigation, and secondly, its potential utility for individuals experiencing significant discomfort with other modalities. Finally, it encourages consideration of the possible influence of specific stimuli used, such as incense for smell and water for sound.

Hypothesis 3 suggested that internal modalities (I-FA and I-OM) would pose less difficulty in the short term and encourage longer practice times/frequency compared to external modalities (E-FA and E-OM). The results partially supported this hypothesis. There were no statistically significant differences in adherence measured by minutes and frequency of sessions for each modality (refer to [Figure 3](#) and [Figure 4](#)). Consequently, the type of modality for learning meditation does not appear to influence adherence to meditation practice. However, we found that it is more challenging to meditate following instructions based on external stimuli than on internal ones, irrespective of whether they are focused or open.

An important aspect of the results is the lack of significant differences in the time and frequency of practice between modalities, aligning with the findings of [Ribeiro et al. \(2018\)](#), who suggested that long-term adherence is comparable across various modalities. This study underscores the tendency of experienced meditators to combine different meditation techniques, adding complexity to the challenge of attributing adherence to specific modalities. Notably, [Matko and Sedlmeier \(2021\)](#) observed a prevalence of internal modalities among experienced practitioners, a finding not in contradiction with [Ribeiro et al.'s \(2018\)](#) report that practitioners often engage in a primary modality consistently while incorporating others secondarily. Although our study focused on beginners learning a new meditation modality each week, with inherent limitations, [Sedlmeier and Theumer \(2020\)](#) included both novices and experts, aiming to explore the intricate and dynamic aspects of meditation. The evolving reasons for initiating and sustaining meditation practice over time contribute to the variability observed in adherence. Therefore, we align with [Hassed et al.'s \(2021\)](#) novel psychometric assessment perspective, emphasizing quantity and quality as essential components for studying adherence beyond mere frequency and time. Our study found these variables insufficient in addressing the complexities observed.

The observed differences in difficulty are noteworthy. Participants indicated that it was easier to learn meditation with modalities based on internal stimuli compared to those based on external stimuli, regardless of whether the meditative process was focused or open. This finding is in partial contradiction to studies such as [Lumma et al. \(2015\)](#), which suggest that novice meditators find focused modalities easier and less demanding.

In early meditation studies, [Delmonte \(1987\)](#) reported that open monitoring meditation produced sensations of expansion and openness not observed in focused meditation. [Travis and Shear \(2010\)](#) associated focused meditations with an active and attentive state, contrasting with open meditations that induce a non-reactive and relaxed emotional state. [Galve \(2013\)](#) explained that focused meditation leads to a state of calm essential for establishing prior to practicing open meditation. Subsequently, [Sedlmeier et al. \(2018\)](#) indicated a much lower decrease in negative emotions and anxiety in open meditation compared to focused meditation. However, our study does not provide support for these contradictory findings, as we found no verifiable differences in well-being between open and focused meditation.

Our conclusions may qualify the original mindfulness protocol ([Kabat-Zinn, 1990](#)), which initially teaches body scan and observation of breathing—both internal stimuli—and later

introduces external modalities. Our results align with this approach, suggesting that external meditations are more challenging to learn and should be postponed until internal ones are fully established. However, the outcomes predicted by our second hypothesis specify less discomfort in open-focus meditation encompassing all experiences (E-OM), taught in the later sessions. This aligns with a major obstacle highlighted by [Birtwell et al. \(2019\)](#) with internal open monitoring (I-OM), specifically the drowsiness it induces. Interestingly, some studies suggest that experienced meditators prefer internal modalities ([Matko & Sedlmeier, 2021](#)), likely due to their clear corporeal connotation, anchoring individuals to the present. Sustaining attention with external stimuli may distract from or impede the full attention and introspection typical of meditative practice.

Someone could argue that the goal of meditation is not solely to induce relaxation or achieve a pleasant state of mind, but rather to cultivate awareness and equanimity in the present moment, aligning with [Hanh's \(1975\)](#) original approach. However, the reality is that it is necessary to balance two objectives simultaneously: developing practices that do not result in excessive frustration for the sake of good adherence and cultivating modalities that serve the objectives of awareness, non-reactivity, and equanimity, among others. Therefore, it becomes crucial to assess subsequent adherence in comparative studies on different meditation modalities. While our study found no significant differences, it could be attributed to the limitation of one session per week, which might be insufficient for the differences to manifest. Consequently, we recommend extending the time frames for future studies and utilizing between-subject designs instead of our within-subject design.

In line with these considerations, a recent research has explored whether mindfulness training, involving open monitoring meditation in a garden setting, resulted in enhanced attention initially but incurred effort, as reflected in performance decrements toward the course end ([Lymeus, Lindberg, & Hartig, 2018](#)).

This study is subject to certain limitations. While a larger and more representative sample in terms of age and sex could enhance the generalizability of the findings, the within-subjects design employed in this study allows for a comprehensive evaluation of the hypotheses, ensuring that all participants experience each condition. However, it is conceivable that the results might differ with the use of different external stimuli, such as a candle. Therefore, the two modalities of external stimuli investigated may not necessarily be representative of the entire category. Additionally, the limited learning time per meditation modality, confined to a one-hour session, might have constrained the learning process. Nevertheless, it is worth noting that other studies have achieved meaningful results with relatively short training times ([Schumer et al., 2018](#)). This study relies on volunteers, potentially introducing selection bias. Participants who voluntarily enroll in a mindfulness workshop may differ from the general population, thereby limiting the external validity of the study. In sum, further replications are needed before unequivocally attributing specific short-term differences between meditation modalities.

This study carries implications for future research. Firstly, while many studies focus on comparing open and focused modalities, they often overlook whether the stimuli used are internal or external. In light of our findings, we recommend that researchers specify the type of stimulus supporting meditation in their investigations. Secondly, our research indicates that different modalities elicit varying degrees of well-being and discomfort. This suggests a need to explore individual differences in response to diverse modalities, potentially contributing to the personalization of MBIs. For instance, investigating the impact of different personality styles on emotional responses to various

modalities and connecting this with the processes of establishing and consolidating formal practice (e.g., Ruiz-Íñiguez et al., 2021) could be fruitful. This is particularly relevant in the case of the External Open Monitoring (E-OM) modality, as indicated by the reduced discomfort observed in this study.

## Conclusion

The study underscores the relevance of examining various meditation modalities systematically. This approach can aid in comprehending the challenges faced by individuals learning to meditate in the short term, which may, in part, be attributed to associated mood states. Certainly, this kind of research has the potential to enhance our understanding and improve both the effectiveness of meditation and adherence to its practice.

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