anales de psicología, 2016, vol. 32, nº 3 (octubre), 749-760
http://dx.doi.org/10.6018/analesps.32.3.261681

ISSN edición impresa: 0212-9728. ISSN edición web (http://revistas.um.es/analesps): 1695-2294

Mindfulness Integrative Model (MIM): Cultivating positive states of mind towards oneself and the others through mindfulness and self-compassion

Raquel Rodríguez-Carvajal[1]*, Carlos García-Rubio[1], David Paniagua[1], Gustavo García-Diex[2] y Sara de Rivas[1]

[1] *Universidad Autónoma de Madrid (Spain).*
[2] *Nirakara Mindfulness Institute (Spain).*

Título: Modelo Integrador de *Mindfulness* (MIM): El cultivo de los estados mentales positivos hacia uno mismo y los demás a través del *mindfulness* y la autocompasión.

Resumen: Cada vez son más los estudios que muestran la eficacia de las Intervenciones Basadas en *Mindfulness* (MBIs) para el cultivo del bienestar. Sin embargo, son escasos los estudios que indagan en los mecanismos que explican su funcionamiento. El objetivo del presente estudio es presentar y validar el Modelo Integrador de *Mindfulness* (MIM), que plantea como principal hipótesis que los incrementos en *mindfulness* rasgo mediante la práctica de la meditación *mindfulness* lleva a incrementos en autocompasión, y éstos, a su vez, dirigen al incremento de los estados mentales positivos hacia los demás y hacia uno mismo. Se diseñó una MBI de práctica intensiva de tres semanas de duración con grupo control no aleatorizado. Para el análisis se dividió a la muestra en función de la experiencia previa en meditación. Los resultados muestran tamaños del efecto grandes para el efecto de la MBI sobre *mindfulness* rasgo, autocompasión y los estados mentales positivos hacia uno mismo y hacia los demás. Los datos respaldan a su vez el MIM, indicando que la práctica de la meditación *mindfulness* lleva al cultivo de *mindfulness* y autocompasión secuencialmente, lo que posteriormente parece llevar al desarrollo de estados mentales positivos hacia los demás y hacia uno mismo.

Palabras clave: *mindfulness*; auto-compasión; bienestar; compasión; intervenciones basadas en *mindfulness*; mediadores; meditación.

Abstract: There are more and more studies showing the effectiveness of Mindfulness-based interventions (MBI) in well-being. However, there are few studies that explore the mechanisms underlying this effect. The aim of this study is to present and validate the Integrative Model of Mindfulness (MIM). MIM main hypothesis is that mindfulness practice leads to an increment in mindfulness trait, which leads to an increase of self-compassion, and these in turn, lead to increase positive mental states towards others and oneself. A MBI intensive three-week with non-randomized controlled group was designed. Participants (N = 87) were differentiated by meditation experience as well. The results show large effect sizes regarding the effect of MBI on mindfulness trait, self-compassion and positive mental states to oneself and to others. The data support the MIM, indicating that the practice of mindfulness meditation leads in a sequentially way to the cultivation of mindfulness and self-compassion, which subsequently appears to lead to the development of positive mental states towards others and oneself.

Key words: mindfulness; self-compassion; well-being; compassion; Mindfulness-based Intervention (MBI); mediators; meditation.

Introduction

Traditionally, the main focus of study in psychology concentrates on psychopathology and the alleviation of symptoms (Barlow & Durand, 2005). Therefore, the study of wellbeing and positive emotions in clinical and non-clinical population has been left quite aside (Sheldon & King, 2001; Seligman & Csikszentmihalyi, 2000). Nevertheless, within the field of positive psychology there has been an effort to design, implement and assess interventions to promote wellbeing and positive emotions in both clinical and non-clinical population (Seligman, Steen, Park, & Peterson, 2005; Sin & Lyubomirsky, 2009). In particular, meditation interventions such as Mindfulness-Based Interventions (MBIs) have proven to be effective increasing wellbeing and positive emotions (Keng, Smoski, & Robins, 2011). Nowadays, there is a synergy between western psychology and eastern contemplative practices (Walsh & Shapiro, 2006). Meditation starts in ancient contemplative philosophies, especially Hinduism and Buddhism where it has been widely developed (Bhikkhu, 2010). One of the key points of Buddhism is to develop and promote skillful means to understand the functioning of the mind, in order to relieve suffering and to enhance happiness (Ekman, Davidson, Ricard, & Wallace, 2005). Buddhism considers that a systematic and contemplative meditation practice is precisely the fundamental element to alleviate suffering and enhance happiness (Ricard, 2008). Concretely, meditation practice cultivates mindfulness abilities, self-compassion and positive states of mind, also called: *brahmaviharas*, the four immeasurables or the sublime attitudes (Goldstein & Knorfield, 2001).

Mindfulness refers to the self-regulation of attention to one's experiences in the present moment with curiosity, openness and acceptance (Bishop et al., 2004). Mindfulness involves the capacity to be aware of internal and external events and occurrences as phenomena, "rather than as the objects of a conceptually constructed world" (Olendzki, 2005). Mindfulness trait has been positively related to psychological well-being (Baer et al., 2008), psychological health (Keng et al., 2011), life satisfaction (Kong, Wang & Zhao, 2014), positive emotions (Fredrickson, Cohn, Coffey, Pek & Finkel, 2008), and self-compassion (Neff, 2003).

Self-compassion is described as a construct formed by three essential factors that could emerge facing adversity: 1) treating oneself with kindness and without harmful judgment, 2) observing our mistakes and failures as part of human experience, and 3) observing negative experience without avoidance, suppression or disconnection from it (Neff, 2003). Self-compassion is related not only to general well-being but also to better adaptation to stressful negative life events (Leary, Tate, Adams, Batts & Hancock, 2007). People

*** Dirección para correspondencia [Correspondence address]:**
Raquel Rodríguez-Carvajal. Dpto. Psicología Biológica y de la Salud. Facultad de Psicología. Universidad Autónoma de Madrid. C/ Ivan Pavlov, 6. 28049. Madrid (Spain). E-mail: raquel.rodriguez@uam.es

that show more self-compassion present higher levels of happiness, life satisfaction and emotional intelligence (see review by Barnard & Curry, 2011), as well as lower levels of psychopathological symptoms (MacBeth & Gumley, 2012).

Positive states of mind, sublime attitudes or *brahmaviharas* are loving-kindness (*metta*), compassion (*karuna*), empathic joy (*mudita*), and equanimity (*upekkha*). In order to scientifically measure these positive states of minds, Kraus and Sears (2009) developed the Self-Others Immeasurable Scale. According to the authors, loving-kindness refers to an unconditional state of kindness towards oneself and the others. Compassion refers to the desire that all beings are free of suffering (including oneself), and it is supposed to emerge once oneself, or other being, suffers. Empathic joy emerges when a person enjoys and feels happy for the achievements and virtues of any person, including oneself. Equanimity refers to an open and tolerant attitude of unconditional acceptance, without any impulsive reaction to inner (oneself) and outer (the others) experience. Despite the relevance of equanimity within a broad conception of mindfulness (Cullen,2011), as well as within Buddhism positive states of mind as thriving and well-being indicators (Goleman, 1988; Kraus & Sears, 2010), there are not many studies paying attention to this construct (Reddy et al., 2013).

In general, MBIs have proven to be effective cultivating a mindful (Nyklícek & Kuijpers, 2008) and self-compassionate attitude (Birnie, Speca, &Carlson, 2010; Kuyken, et al., 2010), enhancing psychological well-being (Chiesa & Serretti, 2009), psychological affect (Bränström, Kvillemo, Brandberg&Moskowitz, 2010; Jain, Shapiro, Swanick, Roesch, Mills, Bell & Schwartz; 2007), and quality of life (Nyklícek & Kuijpers, 2008). In addition, regarding interpersonal context, a meta-analysis showed that meditation practice helps to develop better relationships (Sedlmeier et al., 2012). Research results from MBIs are encouraging; however there is still a need of more studies to understand the underlying mechanisms of mindfulness practice (Gu, Strauss, Bond & Cavanagh, 2015). From the theoretical background there are several models that suggest different mechanisms underlying the beneficial effects of meditation practice (vgr. Baer, 2003; Bishop et al., 2004; Brown el al., 2007; Hölzel, Lazar, Gard, Schuman-Olivier, Vago, & Ott, 2011; Malinowski, 2013; Shapiro, Carlson, Astin& Freedman, 2006). Two of the mechanisms that might explain these positive effects are cultivating a mindful and self-compassionate attitude (Carmody & Baer, 2008; Kuyken et al., 2010; Nyklícek & Kuijpers, 2008; Raes, Dewulf, Van Heeringen& Williams, 2009). Some studies pointed out that an increase of positive affect and positive states of mind were related to a mindfulness trait increment (Baer et al. 2008; Nyklícek & Kuijpers, 2008; Orzech, Shapiro, Brown & McKay, 2009). At the same time, developing self-compassion strategies implicates the appearance of well-being feelings in the face of stressful, hard and negative context that threat the individual (Leary et al., 2007).

In the same line, recent cross-sectional studies shed light into this matter as they studied the relation among meditation experience, frequency of practice, mindful attitude, self-compassionate attitude, and psychological well-being or happiness. Hollis and Colosimo (2011) showed that self-compassion represents a mediator factor in the relationship between mindfulness trait and psychological well-being. Baer et al. (2008) found that the relationship between meditation experience and psychological well-being was totally explained by a combination of mindfulness trait and self-compassion punctuations. Campos et al. (2015) pointed out that in the relationship between frequency of practice and happiness, there were significant indirect effects of observation, self-kindness and shared humanity feeling.

In one hand, these studies shed light into the relationship among meditation practice, mindfulness trait, self-compassion and well-being; on the other hand, these are mostly cross-sectional studies and the mediation models they present, are not supported by pre-existent theoretical models. In order to get over these limitations, and to go in depth into the understanding of the mechanisms of mindfulness, we present the Mindfulness Integrative Model (MIM). The MIM suggests the following: meditation practice leads to sequential acquisition of (1) mindfulness, (2) self-compassion, and (3) positive states of mind (*brahmaviharas*). In particular, the MIM implies that increments in mindfulness will lead to increments in self-compassion, which in turn will lead to increments in positive states of mind (*brahmaviharas*) towards oneself and others.

The MIM follows both Buddhism´s approach (Goldstein & Knorfield, 2001; Ricard, 2008), and Neff approach (2003). Buddisht psychological theory, as well as Neff western conceptualization, point out that mindfulness is a prerequisite of self-compassion. First of all, meditation practice implies to familiarize with the functioning of the mind, to observe with interest, openness, acceptance, without reaction and judgment every mental event (neutral, pleasant or unpleasant). Only when a mindful attitude appears it is possible the non-identification with the events (for example negative emotions and thoughts), and the generation of a mental space where the individual is able to contemplate and recognize the patterns or functioning of the mind, and where finally the individual is able to modify the relationship he/she has towards these mental patterns. Only when the individual experience this non-identification, is he/she able to experience self-compassion in a safe way that implies keeping the negative (as well as positive) events in mind without suppression or avoidance, just as part as universal human experience (Neff, 2003).

In the same line, from the Buddhist conception, self-compassion is considered the prerequisite of the positive states of mind, or sublime attitudes, towards oneself and the others (loving-kindness, compassion, empathic joy, and equanimity) (Goldstein & Knorfield, 2001; Ricard, 2008). Once the individual develop the attitude of being self-compassionate towards him/herself, the likelihood of ap-

pearance of natural positive attitudes towards the others is higher. The individual understand his/her own suffering, and the desire to alleviate it. At the same time, it comes the understanding that suffering is a universal experience, therefore the desire to alleviate one's suffering expands to everyone´ suffering in a natural way. To sum up, cultivating the ability to recognize and be in the presence of one own suffering, neither with identification nor avoidance, and afterwards developing the ability to alleviate that suffering with kindness, understanding that it is an universal human experience, finally all together allows oneself to be open to other people's experience of suffering (Jinpa et al., 2009).

In addition, MIM approach is also coherent with the sequential way mindfulness, self-compassion and compassion skills are taught in mindfulness training. Both, Compassion Cultivation Training (CCT) (Jazaieri et al., 2014) and Cognitively-Based Compassion Training (CBCT) (Mascaro, Darcher, Negi, & Raison, 2015) divide their trainings into three progressive and ordered phases: 1) mindfulness meditation practice, 2) self-compassion practice, and 3) compassion and prosocial practice.

In the present study the MIM will be tested. In order to do so, we designed a specific mindfulness-based intervention (MBI) were the different components of the model were trained sequentially. The MBI was implemented as part of a quasi-experimental, pre-post intervention design with two experimental groups (MBI meditators / MBI non-meditators) and two control groups (meditators / non-meditators). The hypotheses that will be tested in the present study are:

Hypothesis 1: An intensive MBI will enhance mindfulness trait, self-compassion and positive mental states of mind towards oneself and others both in meditators and non-meditators.

Hypothesis 2: the MIM is a sequentially mediated model that explains the acquisition of positive mental states in both MBI meditators and non-meditators.

- H.2.1: Increments in self-compassion due to the MBI program will be mediated by increments in mindfulness trait
- H.2.2: Increments in positive states of mind due to increments in mindfulness trait will be mediated by increments in self-compassion

Method

Design

The present research consisted on a quasi-experimental, pre-post intervention design with two experimental groups (MBI meditators / MBI non-meditators) and two control groups (meditators / non-meditators). All groups were natural groups without randomization. We focused our analysis on testing the relationship between meditators in the experimental group and meditators in control group. As well as testing the relationship between non-meditators in the experimental group and non-meditators in the control group.

Participants

The target population comprised individuals between the ages of 18 and 65 years old. Target sample size was calculated, taking into account a .80 power, with an alpha of .50 and a medium effect size. Using these criteria a target sample of 74 people was established. The sample consisted of 87 adult participants who contacted the institution and met the selection requirements. The requirements were 1) undertake to complete a series of questionnaires pre- and post- evaluation together with performing daily mindfulness practice, 2) be willing and have the necessary feasibility to attend weekly classes from Monday to Friday over 19 days, and 3) do not present any disorder, disease or medical condition that could limit their adherence to the practice or participation. Gender and age were equated taking into account also meditation experience, kind of meditation, practice time, and weekly meditation frequency (number of practices and time spent meditating). After the intervention program, several cases were deleted because of missing data; four in experimental group and 10 in control group. The final sample consisted of 73 participants, of whom 54 were women (74.0%) with an age range of 20 to 65 years (M = 33.9, SD = 11.49). Thirty-six participants took part in the experimental group with a total of 28 women (77.8 %) with an age range of 20 to 60 years (M = 32.25, SD = 11.41), with 23 MBI meditators (16 women) and 13 MBI non-meditators (12 women). Thirty-seven participants took part in the control group with a total of 26 women (70.3 %) with an age range of 22 to 65 years (M = 35.51, SD = 11.49), with 19 MBI meditators (11 women) and 18 MBI non-meditators (15 women). All participants volunteered and signed an informed consent form.

Measures

*Control variables***.** Participants answered several questions about their age, gender, meditation experience, weekly frequency of practice, and duration of meditation sessions.

*Mindfulness trait***.** Mindfulness trait was measured using the Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). This measure comprises five subscales that form a factor of general mindfulness: Observe, describe, act with conscience, not judge their own experiences and not react to their own experiences. It consists of 39 items extracted from a set of instruments that measure mindfulness after a factor analysis. The items are scored on a Likert scale from 1 (never or very rare in my case) to 5 (very often or always in my case). FFMQ five subscales showed adequate internal consistency, with alpha coefficients ranging from .75 to .91 and the relationships between its subscales and other variables were consistent in most cases (Baer et al., 2006). In addition, the FFMQ has shown adequate internal consistency both in

population with and without previous experience in meditation, and its items work in both populations in a very similar way (Baer et al., 2008; Baer, Samuel & Lykins, 2011). The Spanish version of the FFMQ has been validated, and it showed the same factor structure than the original one as well as adequate psychometric properties (scores showed Cronbach alphas between .80 and .91) (Cebolla et al., 2012).

Self-compassion. Self-compassion was measured by using Self-compassion Scale (Neff, 2003). Self-compassion scale is a 26 item self-report measure and it comprises six subscales that measure an attitude of kindness towards oneself, particularly under conditions of negative feelings. The scales are self-kindness, self-judgment, isolation, mindfulness, shared humanity and over-identification. The scale shows a second order factor (self-compassion), that may explain the correlations among the six factors (*NNFI* = .90; *CFI* = .92), suggesting that the subscales can be used individually or together as an overall score. The items are scored based on a Likert scale ranging from 1 ("almost never") to 5 ("almost always"). In addition, the SCS showed adequate internal consistency (.90 - .95 for overall scores and .75 - .86 for the scores of the subscales), convergent and divergent validity, and test-retest reliability (Neff, 2003). The Spanish version of the SCS showed the same factor structure than the original one as well as adequate psychometric properties (Cronbach's alpha for the 26 items of the scale was .87, and for the 6 subscales range was .72 to .79.) (Garcia-Campayo et al., 2014).

Positive states of mind. The positive states of mind were measured using the SOFI: Self-Other Four Immeasurable Scale (Kraus & Sears, 2009). It is a self-reported 16 Likert items scale, ranging from 1 ("not often") to 5 ("very often"). Which measure four qualities that are at the core of Buddhist teachings: kindness, compassion, joy, and acceptance (equanimity) referred to oneself and to others. The scale consists of four subscales: positive qualities to oneself, others made positive qualities, negative qualities to oneself and others made negative qualities. Higher scores on each of the subscales indicate better or worse feelings for (or with) self and (or) the other. In the current study only the scales of positive qualities to oneself and to others were used. The subscales of positive mental states to oneself and positive mental states towards others showed high internal consistency (*alpha* = .86 and .80 respectively; Kraus & Sears, 2009). To use this scale in Spanish a translation process and retro-translation process were independently conducted by two experts; an expert on Buddhism and high knowledge of English carried out the translation, and an expert on English philology carried out the retro-translation. No differences between the two versions were detected.

Procedure

The MBI program was designed to be self-directed and to be accessible and engaging to a wide audience by keeping practices and lessons short. At its core was the development of mindfulness, bringing attention to the present moment with an attitude of nonjudgmental acceptance of one's experience. The program introduced participants to a new meditation theme each day, as described in Figure 1. To great extent, themes and related guided meditation have been inspired from Theravada´s Buddhism mindfulness traditions, hatha yoga and other mindfulness programs, and they were chosen to develop mindfulness skills and traits that support mindfulness and well-being. The use of breath as a reminder of the present moment awareness was emphasized in all meditations. The program was delivered in three components. (1) Practice: daily introductions to the concepts and meditation theme were presented each day (five days a week) during 1 hour; with guided meditations and yoga practice (1,5 hours each day; five days a week) were run in group sessions. (2) Theory: daily lessons provide the scientific underpinnings and merits of each day's theme or discuss various cognitive and behavioral strategies, activities, concepts supporting or related to mindfulness, and the rationale underpinning the practice of Mindfulness from the Theravada Buddhist tradition (2,5 hours each day; five days a week). (3) Home Practice: an online website to support home practice was provided. It contained downloadable mp3 format meditations, mp4 videos of yoga, explanations in pdf format of all practices suggested, daily tips suggesting how to manage stress or incorporate mindfulness in daily activities, and motivational quotes. Participants were invited to practice five times each week and to report those practices. After the complete study was conducted all participants were thanked for their participation. In addition, both control groups received a brief mindfulness course training in return.

Statistical analyses

Preliminary analyses were carried out before testing the hypothesis. Concretely, heterogeneity of sociodemographic variables and variables regarding meditation experience was analyzed. *Chi*-squared and *t*-test for independent samples tests were conducted to check if there were differences between groups in these variables.

The effect of time within groups in each of the study variables was tested as well, for that purpose *t*-tests for related samples were conducted. To test the effect of group before intervention in the study variables several *t*-test for independent samples were conducted. Also size effect was calculated by Cohen's effect size measure; its values .20, .50, .80 represent a small, medium and large effect respectively (Cohen, 1988).

Several ANCOVAs were conducted to test the interaction effect between time and group effects in the study variables. Also the partial *eta* squared (partial η^2) was calculated. Its values .01, .06, .14 represent a small, medium and large effect respectively (Cohen, 1988).

Finally, two mediational models were tested. In order to assess the significance levels of the models, a bootstrapping technique was conducted (same size from the original sample was used as subsample replacement), and the indirect ef-

fects were estimated in each sampling, and during 10000 samplings (Hayes et al., 2011; Taylor et al., 2008). We have focused on the indirect effects of the mediational process as methodological literature points out that there is no need to assume a direct effect before analyzing the indirect effects or the mediation effects (e.g., Hayes, 2009; MacKinnon et al., 2000; Shrout & Bolger, 2002; Zhao, Lynch, & Chen, 2010). Direct effects were also estimated using the macro tool Process for SPSS v2.12.

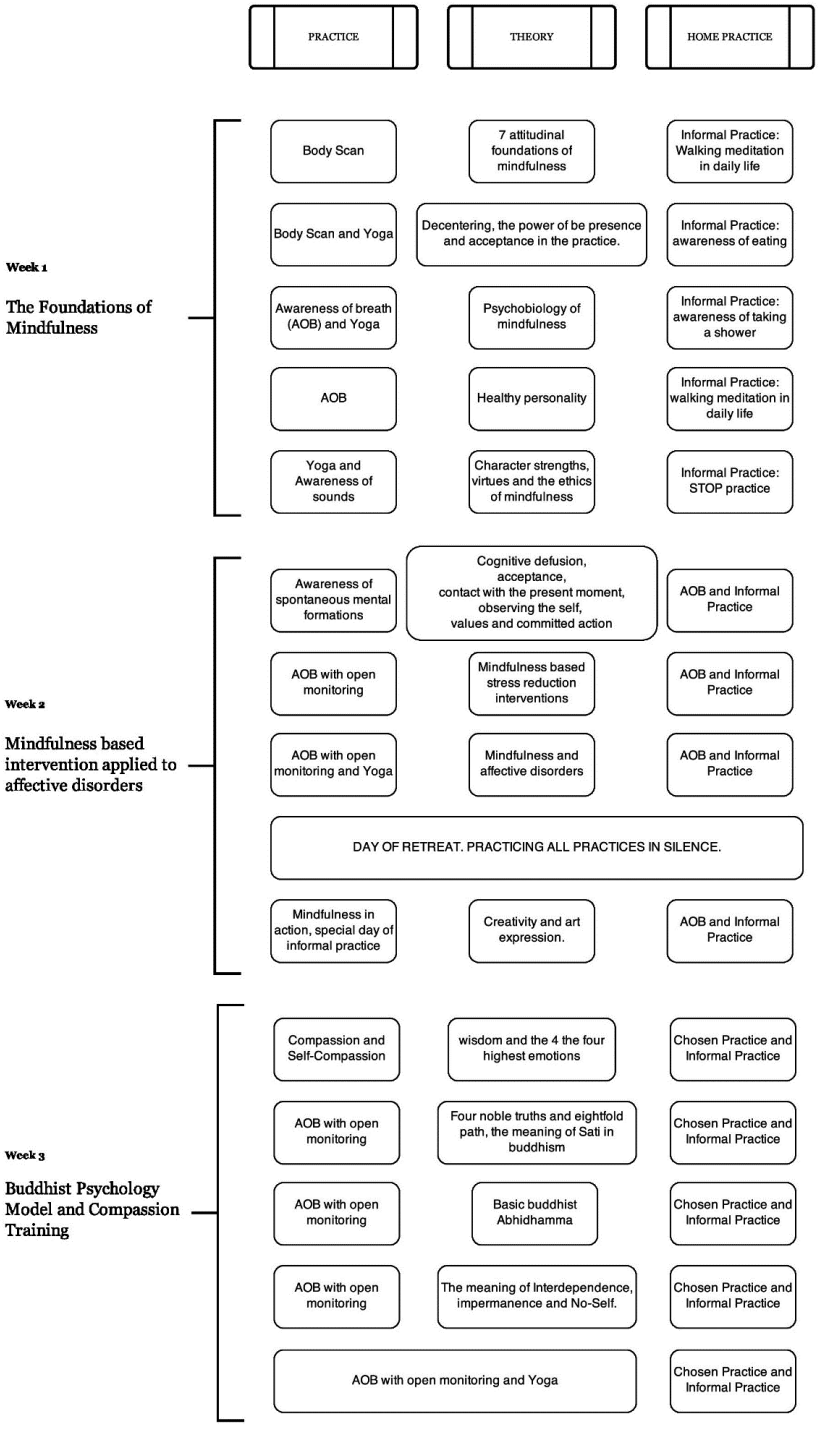


Figure 1. Mindfulness based intervention structure and programming.

Results

Control of variables

No differences were found between experimental and control groups regarding age ($t(71) = 1.22$, $p = .228$), gender (χ^2 (1) = .53, meditation experience ($t(71) = 1.00$, $p = .319$), type of meditation (χ^2 (6) = 3.70, $p = .593$), weekly frequency of practice ($t(70.26) = 1.857$, $p = .067$), and duration of meditation sessions ($t(71) = 1.09$, $p = .28$). No differences were found either analyzing just meditators data from the experimental group (G Ex Med) or from the control group (G C Med) in any of the control variables: age ($t(40) = -1.84$, $p = .073$), gender (χ^2 (1) = .62, $p = .432$), type of meditation (χ^2 (5) = 5.53, $p = .237$), meditation experience ($t(40) = -1.83$, $p = .75$), weekly frequency of practice ($t(39,67) = -3.40$, $p < .01$), and duration of meditation sessions ($t(40) = -2.01$, $p = .051$). In the same line, non-meditators from the experimental group (G Ex Non Med) and the control group (G C Non Med) showed no differences in age ($t(29) = -0.50$, $p = .618$), and gender (χ^2 (1) = .53,$p = .465$).

Mindfulness trait, self-compassion and positive states of mind

To test whether or not before the intervention there were differences among groups in the main dependent variables several independent measures *t* test were conducted (see Table 1), and no significant differences were found. In addition, Table 2 shows the repeated measures *t* test that were conducted to test the effect of the MBI on meditators and non-meditators from time 1 (before MBI) to time 2 (after MBI). No changes were found without MBI intervention in any of the dependent variables. However in the experimental MBI group there were significant increments of mindfulness trait, self-compassion, and positive states of mind. In order to test for the effect in time 2 among the different groups, ANCOVA analyses were conducted (measures at time 1 were introduced in the analysis as covariables, see Table 3). The global effect for the dependent variable mindfulness trait was highly significant $F(3, 68) = 6.84$, $p < .01$, $\eta^2 = .232$. The differences among the groups were significant as well in this variable: $G_{Ex\ Med}$ - $G_{C\ Med}$ ($p = .037$), and $G_{Ex\ Non\ Med}$ - $G_{C\ Non\ Med}$ ($p < .01$). Regarding self-compassion the global effect was highly significant as well, $F(3, 68) = 3.85$, $p < .01$, $\eta^2 = .145$. Significant differences were found between the groups $G_{Ex\ Non\ Med}$ vs. $G_{C\ Non\ Med}$ ($p = .004$). Finally, the variable positive states of mind towards oneself presented a significant main effect F (3, 68) = 56.416, $p < .001$, $\eta^2 = .156$. The different groups showed significant differences as well: $G_{Ex\ Med}$ - $G_{C\ Med}$ ($p = .022$), and $G_{Ex\ Non\ Med}$ - $G_{C\ Non\ Med}$ ($p = .019$). When it came to positive states of mind towards others, there was also a significant main effect $F(3, 68) = 4.20$, $p = .001$, $\eta^2 = .224$, but there were only significant differences between non-meditators groups $G_{Ex\ Non\ Med}$ - $G_{C\ Non\ Med}$ ($p = .002$).

Table 1. Means, standard deviations and *t* test (time 1 – pre MBI).

		Group								*t* test	
		G_{ex}				G_C					
		Meditators		Non-Meditators		Meditators		No-Meditators			
		n = 23		*n* = 13		*n* = 19		*n* = 18			
Variable		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	t_M	t_{NoM}
Mindfulness trait	Pre	2.46	.49	2.22	.40	2.58	.57	2.24	.34	-.681	-.157
Self-compassion	Pre	6.62	1.48	6.60	1.23	6.84	1.20	6.01	1.14	-.529	1.38
Positive states of mind towards oneself	Pre	13.57	3.56	14.46	2.30	14.11	3.02	13.33	2.68	-.523	1.23
Positive states of mind towards others	Pre	14.26	2.77	15.61	2.06	14.79	2.48	14.17	2.20	-.645	1.855

** p < .05. ** p < .01.*
Gex= experimental group; G_C *= control group.*

Table 2. Means and repeated measures *t* test (time 1 pre MBI – time 2 post MBI).

	$G_{Ex\ Med}$				$G_{Ex\ Non\ Med}$				$G_{C\ Med}$				$G_{C\ Non\ Med}$			
Variable	*M* pre	*M* post	*t*	*d*	*M* pre	*M* post	*t*	*d*	*M* pre	*M* post	*t*	*d*	*M* pre	*M* post	*t*	*d*
	n= 23	*n*=23			*n*=13	*n*=13			*n*=19	*n*=19			*n*=18	*n*=18		
Mindfulness trait	2.46	2.68	**-3.70****	-.77	2.22	2.67	**-3.49****	-.97	2.58	2.58	-.00	.61	2.24	2.26	-.37	-.09
Self-compassion	6.62	7.13	**-3.40****	-.70	6.60	7.30	**-5.04****	-1.39	6.84	6.99	-.81	-.19	1.14	1.22	-.70	-.16
Positive states of mind towards oneself	13.57	16.13	**-4.78****	-.99	14.46	16.54	**-4.16****	-.1.15	14.11	14.95	-.37	-1.22	13.33	14.0	-1.14	-.26
Positive states of mind towards others	14.26	16.22	**-4.29****	.90	15.61	16.85	1.69	-.38	14.79	15.47	-1.689	.38	14.17	13.56	-1.138	-.27

*Note: * p< .05. ** p< .01.*
Gex= experimental group; G_C *= control group.*

Table 3. ANCOVA (post –MBI).

	Interaction effect			Group comparisons	
	F	*df*	η^2	IC. DM.	*p*
Mindfulness trait	**6.84****	3	.23		

$G_{Ex\ Med}$ vs $G_{C\ Med}$				(.01, .38)	**.037**
$G_{Ex\ Non\ Med}$ vs $G_{C\ Non\ Med}$				(.21, .64)	**< .01**
$G_{Ex\ Med}$ vs $G_{Ex\ Non\ Med}$				(-.40, .01)	.065
Self-compassion	**3.85***	3	.15		
$G_{Ex\ Med}$ vs $G_{C\ Med}$				(-.08, .73)	.115
$G_{Ex\ Non\ Med}$ vs $G_{C\ Non\ Med}$				(.23, 1.19)	**.004**
$G_{Ex\ Med}$ vs $G_{Ex\ Non\ Med}$				(-.64, .26)	.408
Positive states of mind towards oneself	**4.20****	3	.14		
$G_{Ex\ Med}$ vs $G_{C\ Med}$				(.23, 2.81)	**.022**
$G_{Ex\ Non\ Med}$ vs $G_{C\ Non\ Med}$				(.32, 3.36)	**.019**
$G_{Ex\ Med}$ vs $G_{Ex\ Non\ Med}$				(-1.30, 1.60)	.837
Positive states of mind towards others	**6.53****	3	.22		
$G_{Ex\ Med}$ vs $G_{C\ Med}$				(-.168, 2.30)	.089
$G_{Ex\ Non\ Med}$ vs $G_{C\ Non\ Med}$				(.94, 3.88)	**.002**
$G_{Ex\ Med}$ vs $G_{Ex\ Non\ Med}$				(-1.20, 1.60)	.782

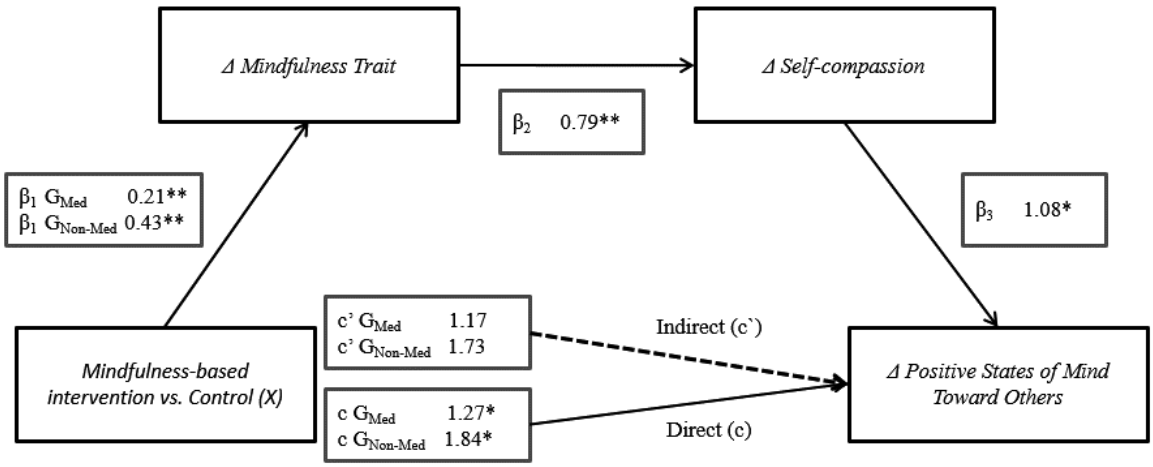
Note: η^2 eta partial square.
*p< .05. **p< .01.
Gex= experimental group; G_C = control group; Med = Meditators; Non Med= No Meditators
IC. DM.= confidence interval mean difference.

Mindfulness integrative model as a sequential mediation model

The models suggested are mediation models with three steps, in particular two models were estimated: the first one (Figure 2) considering positive states of mind towards others (P-others) as its dependent variable, and the second one (Figure 3) considering positive states of mind towards oneself (P-oneself) as its dependent variable.

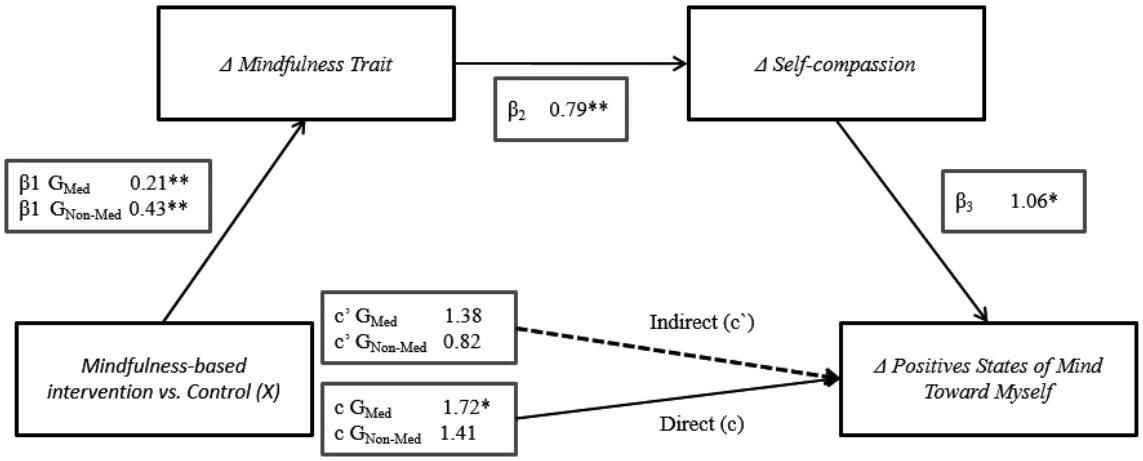
Regarding the P-others model (Figure 2), results showed significant indirect effects for experimental groups of meditators ($\beta_1 G_{Med}$ = .21, p = .005) and non-meditators ($\beta_1\ G_{Non\text{-}Med}$ = .43, p = .006) towards mindfulness trait, as well as significant effects from mindfulness trait towards self-compassion (β_2 = .79, p = .022), and from self-compassion towards positive states of mind towards others (β_3 = 1.08, p = .008). There was a mediation regarding the direct effects found from meditator group (c G_{Med} = 1.27, p = .046; c' G_{Med} = 1.17, p = .055) and non-meditators group (c $G_{Non\ Med}$ = 1.84, p = .049; c' $G_{Non\ Med}$ = 11.73, p = .118) towards positive states of mind towards others.

Finally, regarding the P-oneself model (Figure 3), results showed significant indirect effects from self-compassion towards positive states of mind towards oneself (β_3 = 1.06, p = .018). There was a mediation regarding the direct effects found from meditator group (c G_{Med} = 1.72, p = .028; c' G_{Med} = 1.38, p = .055) towards positive states of mind towards others, but this effect is not found from non-meditators group (c $G_{Non\ Med}$ = 1.41, p = .080; c' $G_{Non\ Med}$ = 0.82, p = .441).



$G_{Med} = G_{Ex\ Med\ vs.}\ G_{C\ Med}$; $G_{No\text{-}Med} = G_{Ex\ Non\text{-}Med\ vs.}\ G_{C\ Non\text{-}Med}$
ΔMindfulness Trait= Pre-Post FFMQ scores; ΔSelf-compassion = Pre-Post SC scores; ΔPositive States of Mind Toward Others = Pre-Post Toward Others SOFI scores.
**= p <.05; **= p <.01*

Figure 2. MIM: positive states of mind towards others.



$G_{Med} = G_{Ex\ Med\ vs.}\ G_{C\ Med}$; $G_{No\text{-}Med} = G_{Ex\ Non\text{-}Med\ vs.}\ G_{C\ Non\text{-}Med}$
ΔMindfulness Trait= Pre-Post FFMQ scores; ΔSelf-compassion = Pre-Post SC scores; Δpositive States of Mind Towards Myself= Pre-Post Toward Myself SOFI scores.
*= $p < .05$; **= $p < .01$

Figure 3.MIM: positive states of mind towards myself.

Discussion

The main aim of the present study was to test the Mindfulness Integrative Model (MIM) through a specific mindfulness-based intervention (MBI) were the different components of the model (mindfulness, self-compassion, and positive states of mind or *brahmaviharas*) were trained sequentially. The second aim was to test for differences in this process between meditators and non-meditators practitioners. The model suggests that the effect of a mindfulness-based intervention on the positive states of mind comes from an increment on mindfulness trait first, followed by an increment of self-compassion, which in turn enhances the positive states of mind towards oneself and the others. Results support our hypothesis regarding both the MIM and the MBI and shed light into the mechanisms of mindfulness: mindfulness-based intervention is effective and apparently there is a sequential acquisition of 1st) mindfulness trait, 2nd) self-compassion, and 3rd) positive states of mind for both meditators and non-meditators individuals. Therefore, the increment of positive states of mind towards others and oneself is apparently mediated by mindfulness and self-compassion.

MBI effects

General results show that the designed MBI was effective to enhance mindfulness trait, self-compassion and positive states of mind towards oneself and others for non-meditators participants. For meditator participants, mindfulness trait and positive states of mind towards oneself was enhanced as well. However, the level of change from before and after the intervention was not statistically significant regarding self-compassion and positive states of mind towards others, even though the MIM was significant as a global process. It should be considered that all size effects of the dependent variables are very large; therefore not finding a significant effect (but tendency) in two particular variables might be due to a low sample size (Coe, 2002; Cohen, 1998; Ferguson, 2009; Olejnik & Algina, 2000).

These general results are in line with previous research that shows that regular mindfulness meditation practice leads to enhanced mindfulness skills (Nyklicek & Kuijpers, 2008; Orzech et al., 2009; Shapiro et al., 2005), self-compassion (Birnie et al., 2010; Kuyken et al., 2010), and increments on positive variables such as wellbeing, affect or life satisfaction (Bränström et al., 2010; Carmody & Baer, 2008; Nyklícek & Kuijpers; Jain et al., 2007; Raes et al., 2009; Robins et al., 2012). There are fewer studies regarding the relationship of mindfulness meditation with the positive states of mind (Kemeny et al., 2011; Sedlmeier et al., 2012). Our results clearly support this relationship due to the large size effect that data show. Mindfulness-based interventions may be enhancing positive states of mind towards oneself and others; consequently it might help to develop prosocial attitudes. This is a very positive result; even more considering that compassion towards others was a very brief part of the intervention. Buddhist tradition (Goldstein & Knorfield, 2001; Ricard, 2001) already pointed out that meditation practice not only has an effect on oneself, but on prosocial behavior (kindness, compassion, empathic joy and acceptance), and a meta-analysis about meditation (Sedlmeier, 2012) apparently goes in the same direction.

Mindfulness integrative model: mindfulness and self-compassion as mediators

Results show that the effect of mindfulness intervention on positive states of mind might be explained by the previ-

ous acquisition of mindfulness skills and self-compassion in that order. Our data support the mediation model where the relationship between mindfulness intervention and positive states of mind is therefore mediated by mindfulness and self-compassion. These results shed light into mediational mechanisms that explain how mindfulness interventions work, and the order of acquisition of the different abilities needed to fulfill mindfulness meditation objectives. In comparison to the great amount of empirical studies about mindfulness interventions efficacy (for a review see Keng et al., 2011), there are few studies focused on unveiling action mechanisms of mindfulness (Gu et al., 2015). Therefore the present study represents a positive contribution to the literature on mindfulness.

In line with our longitudinal results, prior cross-sectional studies developed models trying to explain the relationship among mindfulness meditation practice, mindfulness trait, self-compassion trait, and well-being or happiness. Hollis and Colosimo (2011) for example, showed that self-compassion partially explains the relationship between mindfulness skills and well-being. Baer et al., (2008), showed that meditation experience and well-being relationship was explained by a co-joint punctuation of mindfulness trait and self-compassion. Recently, Campos et al., (2015) showed that the relationship between frequency of practice and happiness levels was mediated by mindfulness and self-compassion levels. Our study allows going depth into this relationship, and points out that mindfulness skills are apparently a prerequisite to self-compassion, and self-compassion leads to positive states of mind towards oneself and others. Neff (2003) points out the same idea of mindfulness as a prerequisite for self-compassion. The ability to observe, without judging, and without immediately reacting to the events is apparently a prerequisite to develop a kindness attitude towards the negative events that might appear. In this line, mindfulness and compassion-based trainings as for example *the Compassion Cultivation Training* (CCT; Jazaieri et al., 2014), the *Cognitively-Based Compassion Training* (Mascaro et al., 2015), or the *Mindfulness-Based Emotional Balance* (Cullen, & Pons, 2015), which are based on Buddhist psychological theory, already include the MIM sequence.

In addition, these results are in line with Garland´s model of positive coping (Garland, Geschwind, Peeters, & Wichers, 2015; Garland, Gaylord & Fredrickson, 2011). Increments in self-compassion mediated by increments of mindfulness skills may allow people to use self-compassion as a self-regulation strategy of emotion (Neff, 2003). Regulating attention towards the present moment experience, observing in a non-judgmental way would allow to recognize unpleasant, hard and painful mental events, and to develop the will to keep them in consciousness without avoiding or suppressing them, and just with a kind attitude recognizing them as part of common human experience (Goldstein & Knorfield, 2001). In other words, developing mindfulness skills and self-compassion reduce perception of threat and enhance openness to experience, which in turn make possible a genuine transformation and/or appearance of positive states of mind towards oneself and the others.

Limitations and future directions

Despite the encouraging results of the study some limitations must be taking into account in its interpretation and as guidance for future studies. First, participants were not randomly assigned to the different groups. For practical reasons it was not possible to randomize meditators and non-meditators into control and experimental group with three intensive weeks of intervention, therefore results must be interpreted cautiously (Kraemer, Wilson, Fairburn, & Agras, 2002). Future studies should include not only randomized experimental and control groups, but also it would be desirable to go for 'active' instead of 'waiting list' group.

Second, the longitudinal study has no follow-up. Participants were contacted via email several weeks after the intervention, however the data collection was not successful in this regard. Many mindfulness intervention studies showed that mindfulness skills might increase after the intervention when people practice them in their daily life (Orzech et al., 2009), therefore it would be interesting to test this effect as well in future studies.

Third, even though data support the MIM, it would be interesting to collect three or more measures during the intervention itself to better support the sequential acquisition that the model suggests. Causality could be inferred in a more robust way if there were more temporal measures were changes in the mediator measure were collected before changes in the dependent variable (Stone-Romero & Rosopa, 2008). Therefore, future studies should include multiple moments of data collection (Kazdin, 2007).

Forth, some authors suggested that construct comprising several sub-dimensions should be studied at subscale level (Smith, Fischer & Fister, 2003). However in the present study data has been analyzed considering global punctuations of each construct. Thus, future longitudinal studies should consider studying sub-dimensions of the present construct. In this line, recent cross-sectional studies (Campos et al., 2015) show that observation skills, self-kindness and shared humanity might explain the relationship between meditation practice and happiness. In addition, a recent longitudinal study (Alda et al., 2016) points out the beneficial impact that might have the presence of shared humanity feelings and the absence of experiential avoidance of thoughts and emotions produced by meditation practice, on keeping telomeres length (which are related with longevity).

Fifth, even though in this study the questionnaires used were independent and validated questionnaires, it is possible that there is a reasonable overlapped among them. Concretely, self-compassion scale (Neff, 2003) mindfulness sub-dimension as the FFMQ has (Baer et al., 2006). However,

the literature shows that there are differences between them (Germer, 2009; Neff, 2003).

In addition, this study collected the data only by self-report measures. These self-report measures have good psychometric properties, however self-report measures are always subject to multiple biases such as social desirability. Future studies could minimize this effect by using more objective measures such as behavioral ones (Levinson, Stoll, Kindy, Merry & Davidson, 2014).

Futures studies could shed light into the idea of what specific practices best contribute to the development of self-compassion skills and positive states of mind based on the MIM model. For example, an interesting question could be if specific practices of concentration and serenity (as conscious breathing or body-scan) might develop by themselves a kind and compassionate attitude. In the same line, the development of specific compassion practices might be a qualitative leap in personal and interpersonal benefits. In this line, the comparison between an intervention mainly focused on mindfulness, as the MBSR or MBCT, and an intervention mainly focused on the development of self-compassion and active compassion, such as CCT or CBCT might provide valuable information to this respect.

Similarly, in future studies it would be of quite interest to test whether the acquisition of mindfulness skills occurs in the same order in different clinical populations as well. This information could provide useful guidance for designing interventions to each population. According to our knowledge, up to now there is no research regarding how the order of practice presentation might influence MBIs benefits.

Conclusion

Summarizing, this is the first longitudinal study exploring the sequential relationship among mindfulness meditation practice, mindfulness, self-compassion, and positive states of mind towards oneself and the others (*brahmaviharas*) that is in line with Buddhist psychological theory and western psychology. The MIM presents, along with empirical evidence, a mediational and sequentially ordered relationship among the variables mindfulness practice, mindfulness, self-compassion and positive states of mind towards oneself and others. These results should be taken into account while designing mindfulness interventions, as it might be wise to explicitly include kindness and compassion practices within the intervention program (review in Galante et al., 2014; Hofmann et al., 2011; Pons, 2014) in order to promote prosocial attitudes.

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(Article received: 02-11-2015; revised: 19-05-2016; accepted: 30-05-2016)