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**Psychological implications of a brief mindfulness meditation
intervention**

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RESUMEN

Mindfulness o plenitud de consciencia hace referencia a una serie de postulados, técnicas y conceptualizaciones psicológicas relativamente nuevas cuyas potenciales aplicaciones siguen siendo exploradas. El siguiente trabajo examina las relaciones existentes entre una breve intervención de *mindfulness* y sus implicaciones a nivel cognitivo y afectivo. Se planteó la hipótesis de que una breve inducción de *mindfulness* tiene influencia dentro del funcionamiento cognitivo en tareas como la fluencia verbal, atención sostenida, velocidad de procesamiento, atención visual, memoria de trabajo e inhibición y flexibilidad psicológica. Asimismo, también se examinó las implicaciones a nivel afectivo en relación a estrés percibido, amplitud de plenitud de consciencia, y dificultades en la regulación emocional. Se utilizó una metodología experimental para evaluar los efectos del *mindfulness* sobre una población universitaria subclínica. Sesenta y cinco participantes (n=65) de la Universidad San Francisco De Quito conformaron la muestra que se dividieron en dos grupos, un grupo control y un grupo experimental. El primero escuchó un audiolibro, siendo un control activo, mientras que el segundo recibió un breve entrenamiento de cuatro días de *mindfulness*. Se tomaron medidas pre-post de los instrumentos afectivos (PSS, DERS, PANAS) después de cada sesión, mientras que las medidas cognitivas (TMT, Digit Span, Stroop Test, VF) se las tomaron solamente antes de la primera sesión y después de la última. Se estableció correlaciones entre las medidas afectivas y cognitivas. Los resultados anticipados indican que existe una posible asociación entre un aumento en niveles afectivos en el grupo experimental y simultáneamente un aumento en el desempeño dentro de las medidas cognitivas. Se busca fomentar la investigación sobre el impacto neuropsicológico y afectivo en poblaciones normales y el estudio del *mindfulness* como una herramienta para mejorar la atención y bienestar general.

Palabras clave: *mindfulness, cognición, afectividad, atención, consciencia, meditación*

ABSTRACT

Mindfulness refers to a series of conceptual, theoretical, techniques and psychological postulates relatively new to which potential applications are being explored. The following study examines the relationship between a brief mindfulness based intervention and its implications at a cognitive and affective level. It was hypothesized that a brief mindfulness induction has influence in cognitive performance as measures by verbal fluency, sustained attention, working memory, visual attention, processing speed, inhibition and psychological flexibility tasks. Similarly, affective implications were examined in relationship to perceived stress, emotional regulation and mindfulness. Experimental design methodology was used to evaluate the effects mindfulness over a sample of subclinical undergraduate participants. Sixty five participants (n=65) of the Universidad San Francisco De Quito conformed the sample and were assigned to either a control or a experimental group. The first group listened to an audiobook, being an active control, while the experimental group received the mindfulness intervention. Affective measures were taken pre-post each session (PSS, DERS, PANAS), while cognitive measures (TMT, Digit Span, Stroop Test, VF) were taken before the first session and after the last session. Correlations were established between both constructs. Anticipated results based on previous literature indicate that there might be a possible association between an increase of positive affect and mood and cognitive performance within the experimental group. Research is expected to be promoted regarding neuropsychological and affective impact en normal populations and the study of mindfulness as a tool to improve attention and well-being.

Keywords: *mindfulness, cognition, affect, attention, awareness, meditation*

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INTRODUCTION

Mindfulness meditation is practice that has been gaining recognition in the treatment and prevention of psychological difficulties, as well as demonstrating increased performance in a variety of cognitive functions. Cognitive tasks such as attention, visual attention, inhibition, flexibility, working memory (WM), sustained attention, and executive functioning have been reported to improve after mindfulness based interventions (Cahn & Polich, 2006; Zeidan, Johnson, Diamond, David, Goolkasian, 2010; Jha, Krompinger & Baime, 2007; Moore & Malinowski, 2009; Lippelt, Hommel, Colzato, 2014; Chambers, BCY Lo, Allen, 2008). Several studies and reviews have found the benefits and increasingly positive effects of mindfulness mediation approaches for physical and psychological conditions. (Carlson, Speca, Faris, Patel, 2007; Ma & Teasdale, 2004; Grossman, Niemann, Schmidt, Walach, 2004; Moritz, Cludius, Hottenrott, Schneider, Saathoff, Kuelz, Gallinat, 2015; Tabak, Horan & Green, 2015; Van der Velden, Kuyken, Wattar, Crane, Pallesen, Dahlgaard, Fjorback, Piet, 2015; Williams, Crane, Barnhofer, Fennell, Duggan, Hepburn, Goodwin, 2008; Teasdale, Segal, Williams, 2000). Mindfulness based practices have also been reported to improve mood, reduce stress and ameliorate the quality of life of healthy individuals (Khoury, Sharma, Rush, Fournier, 2015). Current literature has been increasingly adding new findings to support the application and design of mindfulness-based interventions due to the benefits that it can provide.

The definition of mindfulness involves two basic elements. According to Brewer, Bowen, Smith, Marlatt, and Potenza (2011) it involves: “the placement of attention on the immediate experience; and, adopting an open, curious, accepting attitude toward that experience” (p.2). Kabat Zinn (2003) introduced the conceptualization of mindfulness to the

western public awareness within the medical and academic environment with the development of Mindfulness Based Stress Reduction Programs (MBSR).

He defines mindfulness as “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment.” (p.145). Marlatt and Kristeller (1999) also emphasize the definition of mindfulness as “bringing one’s complete attention to present experience on a moment-to-moment basis” (p.68). Ultimately, the concept of mindfulness involves the capacity to observe internal and external experiences in a non-judgmental way.

Several psychological treatments have incorporated mindfulness either as a form of intervention or as part of their theoretical conceptualization of difficulties. Acceptance and Commitment Therapy (ACT) (Hayes, Wilson, Strosahl, 1999), Dialectical Behavior Therapy (DBT) (Linehan, 1993), and Mindfulness-based cognitive therapy (Teasdale, Segal, Williams, 1995) are some of the most relevant modalities of psychological interventions that have incorporated mindfulness in their treatment protocols. These give us knowledge about the importance of developing mindfulness-based interventions for psychological disorders and psychological distress in general.

Nevertheless, the focus of mindfulness meditation practices has not been studied as extensively within non-clinical and subclinical populations, namely relatively healthy individuals whose psychological state is adequate and functional, and those people that suffer from adaptive stress or symptoms without meeting criteria for a disorder. Mindfulness Stress Based Reduction (MBSR) programs have been reported to have helpful efficacy with mood and affective processes. Moderate effects on depression, anxiety and distress, as well as a large reduction in stress and an increase in quality of life have been

reported with the use of this particular kind of intervention. However, they require about 8 weeks of training (Nyklíček & Kuijpers, 2008; Khoury et al., 2015). These interventions, although beneficial require commitment in time and financial matters to assure effective results. For practical purposes then, it would be helpful to implement short-term based interventions that could improve cognitive and affective processes without extensive formal training and commitment.

Few studies have observed the impact of mindfulness- based interventions on non-clinical populations. Zeidan et al., (2010) did study the relationship between a brief mindfulness intervention that produced positive results regarding cognitive and affective processes. Working memory, visuo-spatial processing and executive functioning did improve overall in comparison to the control group. Their findings supported the hypothesis of improvement overall in general cognitive and affective measures in a sample of undergraduate students that received brief meditation exposure (20 minutes for 4 days). Concurrently, Banks, Welhalf, Srour (2015) also found that although brief mindfulness meditation training did not improve working memory or decrease mind wandering, it did prevent stress related working memory impairment.

The importance of developing brief interventions for ameliorating stress is crucial to improve the general well-being of people. Cognitive performance is known to be impaired when mood is unregulated, when psychosocial stressors, and self-reported negative life stress are present (Klein & Boals, 2001; Stawski, Sliwinski, Almeida & Smyth, 2008). Negative self-reported affect has been related to impairment in WM, and an increase in mind wandering (Smallwood, Fitzgerald, Miles & Phillips, 2009). Subsequently, understanding the processes that underlie these type of interventions is critical to generate the prevention of

deteriorating stress and prophylactic benefits in psychological health overall (Banks, et al., 2015).

Considering these factors, it is crucial to generate a comprehensive theoretical and practical framework that can be used for the creation of simple and relatively short-term mindfulness based meditation practices. This could be helpful to enhance attention and executive functioning for critical periods on non-clinical population such as when preparing for academic examinations, work-related projects, studying, and performance in any domain. Overall, general well-being and psychological health can potentially be achieved through the use of meditative mindfulness based practices within subclinical or non-clinical population.

Regarding the current literature in Ecuador, to date there is no study, review or proposed research that has been published in relation to this topic. Therefore, it is important to stimulate the development of such projects. In this way, potentially it could be beneficial to implement such procedures for the improvement of academic performance in undergraduate students during critical periods (such as final examinations and task related assignments) and also increase general well being. It is hypothesized that a brief mindfulness induction intervention can improve measures of cognitive performance and enhance positive affect.

LITERATURE REVIEW

The literature regarding mindfulness meditation procedures does provide an extensive framework in relationship to enhance of mood and cognitive functions. Overall, during recent years there has been more adequate evidence to provide a consistent and less methodologically flawed method for mindfulness based interventions. The following literature review will concentrate on three interrelated domains with the concept of mindfulness that are of relevance for this study: Cognition, Mood, and Well Being.

Mindfulness and Cognition

The effects of mindfulness-based interventions on cognition have developed a systematic and particular interest for research in the past decade. Overall, there has been extensive research over mindfulness and its impact since the implementation of Kabat Zinn (2003) MBSR. Although there has been an increasingly amount of research destined to evaluate the impact of mindfulness based intervention on cognition, several issues have arisen at the moment of operationalizing the concept of mindfulness and the methods to study its impact. Regarding this particular matter, in their review Chiesa, Callati, and Serretti (2010) address the fact that both, mindfulness and cognitive functions are constructs in which there is not clear consensus over their specific functioning and classification. The lack of a definitive definition of mindfulness makes it difficult to establish operationally scientific definitions for research. Nonetheless, well-grounded attempts have produced general conclusions about mindfulness that have been used for research. As Chiesa et al., (2010) state it involves an emphasis in two elements. The first one refers to a state of the mind that is characterized by complete attention to internal and external experiences in the present

moment (Kabat Zinn, 1994; Chiesa et al., 2010; Brown & Ryan, 2003; Bishop, Lau, Shapiro, Carlson, Anderson, Carmody, Segal, Abbey, Speca, Velting, Devins, 2003). The second aspect, involves a critical factor that Chiesa et al., (2010) found as: “a particular attitude characterized by non judgment of openness to current experience, which is supposed to lead to higher levels of exposure to negative stimuli and emotions as well as higher acceptance and concurrent reduction of experiential avoidance” (p.450-451). Discrepancy still exists although ultimate operational definitions of mindfulness have been established (Bishop et al., 2003).

On the other hand, cognition has also conceptual and operational problems. Again Chiesa et al., (2010) emphasize that there are numerous theories that have provided a framework especially for memory, attention and executive function. Three distinct neural networks have been distinguished for attention: *Alerting* (sustained attention or vigilance), *Orienting* (concentration or selective attention), *executive attention* (conflict monitoring) (Posner & Petersen, 1990; McDowd, 2007; Posner & Rothbart, 2007). The model proposed by Mirsky, Anthony, Duncan, Ahearn and Kellam (1991) also includes *switching* that is the faculty to change the focus of attention in an adaptive and flexibly way. This distinction and conceptualization of attention is important to define theoretically since the methods to measure attention usually differ depending on the focus of the mediation practice and the particular kind of this construct.

Attention constructs also overlap with executive functions. Although it is beyond the scope of this study to provide an thorough and meticulous review of cognitive and executive functions overlapping, it is important to recognize some facts that are considerable at the moment of interpreting results that have outcomes related to attention, memory or

executive functioning. Miyake, Freidman, Emerson, Witzki, Howerter, and Wager (2000) found the distinctive characteristics of shifting, updating, inhibition and their roles in complex executive functioning. Through the use of the Wisconsin Card Sorting Test (WCST), the Tower of Hanoi and the random number generation they found that the three functions are moderately correlated with each other. However, these functions are found to be separable and distinctive. Chiesa et al., (2010) argue that within these findings there is also an overlap between shifting, inhibition and attention models.

Comprehending critical conceptual elements within the research of attention and executive functions is important to note previous research related to mindfulness. Research suggests that mindfulness based interventions increase sustained attention, working memory, and help reduce mind wandering (Jha et al., 2007; Moore & Malinowski, 2009; Zeidan et al., 2010; Mrazek, Franklin, Tarchin, Baird, Schooler, 2013; Maclean, Ferrer, Aichele, Bridwell, Zanesco, Jacobs, King, Rosenberg, Sahdra, Shaver, Wallace, Mangun, Saron, 2010; Chambers et al., 2008; Jha, Stanley, Kiyonaga, Wong, Gelfand, 2010). Nevertheless the studies differ in several methodological factors and they vary vastly regarding type of meditation used, sample size, cognitive and affective measures, type of control, time-lapsed intervention, etc.

Meditation, independently of its type and approach has been reported to increase sustained attention and impulse control (Kozasa, Sato, Lacerda, Barreiros, Radvany, Russell, Sanches, Mello, Amaro Jr, 2012). Colzato, Ozturk and Hommel (2012) found evidence for the impact of focused attention and open monitoring training in the stimulation of convergent and divergent thinking. These cognitive processes can be regarded as a measure of executive functioning since they are related to problem solving skills, suggesting there are different

cognitive elements that unfold during meditation training. One important aspect concerning these findings is that Buddhist meditation practices have been determined to have to different aspects that have been conceptualized. According to Lutz, Slagter, Dunne and Davidson (2008) there are two processes involved in the conceptualization of meditation training. Two styles involved different neural circuitry; there are *Focused Attention Meditation (FA)* and *Open Monitoring (OM)*. The difference underlies in the focus of attention, in the first one there is a particular object in which attention is focused, whereas in open monitoring meditation there is an unfolding of non reactive monitoring of mental state that unfold moment by moment (Lutz et al., 2008). This ultimate type is more related to the concept of mindfulness, unfortunately many meditation practices involves both processes and is hard to distinguish them on neurobiological circuitry and practice (Cahn & Polich, 2006). Meditative practices have proved to be effective overall regarding attention tasks as measured by the attention network test (Tang, Ma, Wang, Fan, Feng, Lu, Yu, Sui, Rothbart, Fan, Posner, 2007; Jha et al., 2007;), an fMRI adapted Stroop Word-Colour Test (Kozasa et al., 2012), the stroop test (Moore and Malinowski, 2009; Wenk Sormaz, 2005; Semple, 2010; Teper & Inzlicht, 2013) and other several cognitive measures of attention (Zeidan et al., 2010).

Short, Kose, Mu, Borckardt, Newberg, George (2007) found objective evidence to explain the neurobiological processes involved in the use of meditation. Dorsal and lateral prefrontal cortex and the anterior cingulate cortex were regions activated during an evaluation with fMRI. They concluded, that: "brain regions associated with attention vary over time of a meditation session and may differ between long and short term meditation practitioners (p.121). Nevertheless, objective evidence regarding neuropsychological

substrates is still ambiguous due to the complex overlapping in neural circuitry that affects the measurements of neuropsychological processes such as attention and memory. Cahn and Polich (2006) exhaustive review on EEG, ERP and neuroimaging studies found that meditation appears to influence the activation in changes of the anterior cingulate cortex and dorsolateral prefrontal cortex. Findings regarding visible changes also were related to regional cerebral blood flow measures during meditation and amplitude and latency changes in electroencephalographic measures (Cahn & Polich, 2006).

As for other executive functions and cognitive functions the effects have been studied similarly exhibiting less interferences in the stroop test (Moore and Malisnowski, 2009), better performance in the same test (Wenk-Sormaz, 2005; Teper & Inzlicht, 2013) and conflict monitoring in experienced meditators (Jha et al., 2007). Inhibition and attention switching cognitive processes have been enhanced with mindfulness and meditative practices, although this might require extensive retreats or long periods to assess performance (Chambers et al., 2008; Semple, 2010, Tang et al., 2007; Maclean et al., 2010; Jha et al., 2007; Tang et al., 2010). Moore, Gruber, Derosé and Malinowski (2012) review in their study several of this findings stating their differences in methodology and time-lapse interventions, and stating that current evidence has made it extremely difficult to establish a proper amount of meditation or mindfulness based techniques in order to achieve positive results. Findings of this study that included the stroop test as a measure of cognitive control and several electrophysiological markers of attention control, suggest that mindfulness meditation practice could alter the allocation of cognitive resources that leads to the improvement of self-control and regulation of attention.

As seen the literature regarding mindfulness and meditative practices and their effect on cognition is extensive and varied. Research does support the notion of this practice as a mean to enhance attention, working memory and executive functioning. This suggests even brief interventions could increase sustained attention and cognitive variables.

Mindfulness, Mood and Well Being

Research related to the improvement of mood and affective processes of meditation and mindfulness-based practices have been more easily identifiable and recognizable than the improvement of cognitive processes. Across the studies and reviews, evidence has offered affective and overall well-being measures. Since most of the scales used to measure this component are self-report measures they do present a general bias (Aiken, 2003). However, scales used across several for the studies do provide consistent validity and reliability and the critical concepts related to affect such as emotional regulation, mood, and self-regulation are interrelated with executive control, conflict monitoring and attention processes (Bishop et al., 2004). Zeidan et al., (2010) for example examine the effects of a brief mindfulness meditation intervention in non-clinical population and assessed mindfulness, anxiety and general mood with the Freiburg Mindfulness Inventory, the State Anxiety inventory and the profile of mood states. Experimental and control groups improved in scores related to overall mood including reduced fatigue, depression, confusion, tension and anger subscales. Anxiety improved on only within the experimental group.

Affective regulation and control has been linked positively with mindfulness based intervention and meditative states. Inhibition performance was related to general improvement within socio-emotional measures interrelated with depression, anxiety, emotional regulation, well-being, ego resilience, empathy, and others (Malinowski, 2013).

Taking into account Gross (2002) emotional regulation model it is possible also to relate inhibition, flexibility and attention towards the use of strategies. There are two strategies, *antecedent focused strategies*, which “refer to the things we do before the emotional response tendencies have become fully activated and have changed our behavior and peripheral physiological responding” (p. 282), and *Response focus strategies* that “refer to things we do once an emotion is already underway, after the response tendencies have been generated” (p.282). Several of the following systematic processes that follow in relation to this structure are linked to cognitive appraisal, evaluation and transformation. *Attention deployment* is the selection of a particular aspect of the situation that is focus is on (Gross, 2002) inevitably invokes the concept of orienting and executive attention (Posner & Petersen, 1990; McDowd, 2007; Posner & Rothbart, 2007) and also Mirsky’s model of attention, specifically *focus- execute attention* and *shifting* (Mirsky, 1996). Furthermore, Gross (2002) also proposes two specific ways of emotional regulation, *Cognitive reappraisal* and *Expressive Suppresion*. Both forms of emotional regulation are important concepts to consider within the conceptual context of mindfulness meditation practices since the attention component, being a cognitive element is tightly related to these psychological procedures.

Considering the emotional regulation context as one inherently interrelated with cognitive functions, the mechanisms by which mindfulness has an impact in affective measures are still not well established (Chambers, Gullone, Allen, 2009). Several studies have partially supported reduced quantitative scores in anxiety, depressive symptoms, higher levels of mindfulness attitude, and diminished negative affect in non-clinical population (Chambers et al., 2008; Shapiro, Brown, Biegel, 2007; Shapiro, Astin, Bishop,

Cordova, 2005; Jimenez, Niles, Park, 2010). In a complex study by Davidson et al., (2003) found preliminary objective evidence regarding reduction in anxiety and immune function suggesting that a MBSR program intervention “can produce increases in relative left-sided anterior activation that are associated with reductions in anxiety and negative affect and increases in positive affect” (p.569). The results of these studies support the assertion that mindfulness base practice does have a positive effect on affective regulation.

Additionally, Hayes and Feldman (2004) argue that *experiential avoidance* an emotional regulation strategy that equivalent to expressive suppression (Gross, 2002) can be useful at times, but for the most part is associated with worst psychological outcomes at the long term involving distraction, abuse, denial, cognitive distortions, self-harm, dissociation and even suicide in non-clinical and clinical populations. Mindfulness meditation practices on the contrary, do involve a distinctive and particular kind of emotional regulation. Chambers et al., (2009) argue that although cognitive behavioral techniques are related with Gross (2002) model of *cognitive reappraisal*, mindfulness “holds that all mental (cognitive and emotional) phenomena are merely mental events, and thus do not need to be acted upon” (p. 567). Its focus is more on conflict monitoring and the non-judgmental value of any experience that unfolds moment by moment (Kabat Zinn, 2003). Mindfulness does not conceptualize feelings and thoughts as having and inherent existence such as in CBT, simply it allows emotional and cognitive processes to come and go, ultimately leading consciousness to chose and potentiate feelings of greater well-being (Chambers et al., 2009). Eventually, forms of emotional regulation proposed by the mechanisms of mindfulness may be of greater utility and outcome in the long-term for dysregulated affective related disorders.

A study by Ehring, Tuschen-Caffier, Schnulle, Fischer and Gross (2010) evaluated emotional regulation strategies and found that suppression was ineffective for down-regulating negative emotions. Also examining the effects of mindfulness breathing techniques on emotion regulation Arch and Craske (2006) found that 15 minutes of recorded focus breathing inductions (Kabat Zinn, 1990) adapted from Kabat Zinn's MBSR program is beneficial to maintain regulation across emotional stimuli. Additionally, Watford (2015) found that mindfulness induction could increase mindfulness, greater frontal lobe asymmetry, heart variability, emotional awareness and reduction of emotional avoidance. However, the author concluded that: "mindfulness induction was successful in reducing emotional avoidance, but failed to improve emotion regulation capacity sufficiently to withstand the demands of an aversive emotional experience" (p.2). Clinically this has implications since it appears that dysregulation may be exacerbated while initially experiencing increased mindfulness.

Moreover, several studies have demonstrated and suggested effectiveness with the management of different psychological disorders and medical conditions (Baer, 2003; Kabat Zinn, 2003). Evidence has supported mindfulness interventions for major depressive disorder (Teasdale et al., 2000; Hoffman, Sawyer, Witt, Oh, 2010; Ma & Teasdale, 2004; Van der Velden et al., 2015), psychosis and schizophrenia (Moritz et al., 2015; Tabak, Horan & Green, 2015), bipolar disorder (Williams et al., 2008) and anxiety (Evans, Ferrando, Findler, Stowell, Smart, Haglin, 2008; Goldin and Gross, 2010). These findings have led also to the development of psychological treatments and interventions that have incorporated mindfulness as part of their clinical conceptualization of psychological dysfunction (Baer,

2003). It is fundamental to consider this since evidence for clinical settings reveal that mindfulness and meditative practice might be helpful also to improve mood affective measures and overall well-being in non-clinical populations.

Likewise, some meta-analysis have provided a general overview regarding the benefits and positive effects of mindfulness on mood. Although most of the reviews have included long term meditative practices and programs, specially MBSR, they support the notion of mindfulness as a way of increasing positive affect and reducing stress. Khoury et al., (2015) analyzed 29 studies of MBSR and found that there are “large effects on stress, moderate effects on anxiety, depression, distress and quality of life, and small effects on burnout” (p.519). Nevertheless, it is still important to determine the ways in which these interventions work. Another review by Toneatto and Nguyen (2007) found there is equivocal evidence for the support of MBSR in relationship to symptoms of depression and anxiety. Methodological aspects of this study may where more rigorous, however the authors do mention, “symptoms of depression and anxiety may not ameliorate when they are not the explicit focus of an MBSR intervention (that is, when subjects with medical conditions are included)” (p.264). Chiesa and Serretti (2009) reviewed 10 controlled trials of MBSR in healthy population and found a non-specific effect on stress reduction similar to relaxation exercises, but whose mechanisms are clearly in need of more research. Chambers, Gullone, and Allen (2009) propose in their integrative a differentiation of mindfulness from Gross (2002) two distinctive emotional regulation methods and emphasize the importance of integrating mindfulness and Buddhist concepts into the perspectives of psychological distress in the western world. Overall general findings do support the notion of mindfulness-based interventions for healthy participants and clinical conditions because they improve

general well-being and psychological health (Keng, Smoski, Robins, 2011). Still, there is the need to establish adequate operational definitions to precisely identify the mechanisms in which mindfulness may work with mood and affective processes. The purpose of this study will be to provide a small but comprehensive review of this findings and search for support of mindfulness as a way of increasing attention, ameliorate stress levels, reduce mind wandering, and increase awareness of mindful attitudes. It is hypothesized that mindfulness meditation training in its brief form will improve measures of cognition and affect.

METHODOLOGY

Participants

The sample for this study will consist of sixty-five undergraduate students from the Universidad San Francisco de Quito (USFQ) who will volunteer for the experiment as they can obtain 2% extra-credit in the general psychology classes. Varied demographics are expected (25 men, 40 women, $M_{age} = 19$ years, age range: 17-25). Participants will belong to a middle-upper socioeconomically status, mainly being “*mestizos*” as their ethnicity. They serve as representative sample for undergraduate students at USFQ because they belong to non-clinical population and effects are intended to replicate findings found by Zeidan et al., (2010) in undergraduate students. Participants will be assigned upon the day and week in which the participant signs up for the study.

Recruitment of participants

Participants will be recruited by several means. Participation in the study will be compensated by 2% extra credit in all General Psychology classes (SIC-201). A promotional poster for the study will be designed to communicate and motivate undergraduates to participate and will be sent to the professors that teach the nine courses available for the second semester 2015. An official communication to the professors will be also sent in order to inform them about the study and asking them to confirm whether it would be possible to have extra-credit participation.

Study Design

The study design chosen for this study is the experimental design. Within this particular approach, independent variables are controlled by the experimenter and used to see if there is a casual relationship with the outcome or results in the dependent variables (Cozby, 2012). All variables are kept constant through the use of random assignment and direct experimental control (Cozby, 2012). The use of an experimental group which is the group that receives the intervention or treatment versus a control group which does not ensures the manipulation of the variables to see there is particular effect of the independent variable (Hernández, et al., 2010). Several models and types of the experimental design exist depending on the complexity of the design. The simplest basic model has two variables: the independent and dependent variable (Cozby, 2012). This design can involve either a posttest-only design, or a pre-test post-test design to establish the different outcomes of the interventions or independent variables given. Also, within the experimental design classification can be categorized by the groups assignment to the conditions. An independent group design or between subjects design involves the use of different groups, while a repeated measures design or within subjects design require the same group to be assigned to the conditions being compared with their previous state (Cozby, 2012).

The use of the experimental method within psychology has had an important impact for the development of empirical and validated constructs all over the discipline (Martin, 2008). Campbell (1957) provided several criteria by which the uses of the experimental design in social settings need to take into account. Among these they were history, maturation, testing, instrument decay, regression, selection and mortality. The overall variation and effects of these variables need to be taken into account in order to maintain

internal validity, which is “ability to draw conclusions about casual relationships from the results of a study” (Cozby, 2012, p.85). External validity, or the ability to generalize results towards other populations are also affected by these variables. Kirk (2009) provides information about the advantages of using two groups in the independent samples t-statistic design that will increase internal validity to the experiment. This was a primary reason to use the experimental design with two groups. Random assignment is also considered to be essential for to preserve the validity of the experiment, as well as the measurements of the dependent variables at the same time and under the same conditions (Kirk, 2009). Limitations of this method involve several difficulties that affect the internal validity, including demand characteristics, participant-predisposition effects and experimenter-expectancy (Kirk, 2009).

Procedure.

Regarding this study, the primary focus will use an independent group design, with a control and experimental group. The procedure will follow Zeidan et al., (2010) protocol methodology. The control group will listen to an audiobook, while the experimental group will receive the brief mindfulness training, based on shamatha skills (Wallace, 2006). Additionally, both groups will be measured on cognitive and affective measures before and after the intervention (pre-post). Cognitive measures will be assessed before session 1 and after session 4, while affective measures will be assessed after each of the 4 sessions of intervention, except for the Mindfulness Attention Awareness Scale (MAAS), that also will be administered after the fourth session. Moreover, a correlational design will be used to established differences between groups and the relationships between increases or decreases of cognition and mood. The session will consist of twenty minutes of mindfulness

meditation conducted by a facilitator with experience in teaching meditative practices. A manipulation check will be done after each session in order to ensure that participants feel that they are truly meditating.

Materials.

Data collection will use several standardized Spanish versions for the affective measures while the cognitive measures will use standard procedures. Tests included measuring affect and mood will be: The Mindfulness Attention Awareness Scale (MAAS), the Perceived Stress Scale (PSS), the Difficulties in Emotion Regulation Scale (DERS) and the Positive Affect and Negative Affect Schedule (PANAS). On the other hand, tests included to measure cognitive function will be: the Stroop test (Stroop, 1935), Trail making test (TMT) originally conceived by Reitan (1958), Verbal Fluency (VF) according to the model by Henry & Crawford (2004), and Digit Span (backwards and forward) from the Wechsler Adult Intelligence Scale (WAIS) by Wechsler (2008). It is essential to provide specific information about the reliability and validity of these tests translated versions will be used for all of them.

Currently there are no standardized versions of these instruments in Ecuador; preliminary research regarding each of these measures is necessary in order to motivate studies that will produce self-report and cognitive measures for Ecuadorian population. For the MAAS, standardized Spanish versions include the ones by Barajas and Garra (2014) and by Soler et al., (2012). Also, there is a version by Araya-Vargas et al., (2009) for Costa Rica. The version more closely related for the purposes of this study will include the Mexican version from López-Maya et al., (2015). Psychometric properties were well established with

a good Cronbach's alpha of 0.89, correlations between factors were higher than in the original scale by Brown and Ryan (2003).

Likewise, the PSS has been validated in Spanish clinical and non-clinical samples. Remor (2006) evaluated the psychometric properties of this scale in a Spanish population. However, for cultural and ethnographic reasons again, the validated Mexican version by Ramirez and Hernández (2007) will be the one used in the study. Their cultural adaptation will provide the closest to the reality of the Ecuadorian sample. Psychometric properties were established as appropriate with Cronbach's alpha of 0.83 and convergent validity was adequate regarding measures of depression and emotional exhaustion. Similarly, for the DERS a Spanish validated version exists (Hervás & Jódar, 2008). Yet, the most accurate version that can closely resemble ecuadorian population is Guzmán-González et al., (2013) chilean version. A large sample was used for the validation of this instrument (n=2179) of which a 1018 were undergraduate university students. Internal consistency of their validation was proved good with a total Cronbach's alpha of 0.92 and higher Cronbach's alpha across scales higher than 0.71. Correlations were also found to be adequate, but statistical difference in the factorial design made them rearrange Hervás & Jódar (2008) version and reduce the total number of items to 25. Finally, the Positive affect and Negative Affect Schedule (PANAS) will be included in the general assessment of mood. A Chilean version validated in undergraduate students by Dufey and Fernández (2012) will be the one used for the purposes of measuring general affective feelings before and after each intervention. Good internal consistency, test-retest reliability and external validity was found in their review.

In contrast, cognitive measures involve basic processes that are common to frontal lobe function across cultures (Puente & Agranovich, 2004). However, research in cross-cultural neuropsychology has argued that the influence of culture in the vast majority of tests need to be taken cautiously when cognitive functions are generalized to non-western based environments (Puente & Agranovich, 2004). Since the population involves a sample that is very western influenced in lifestyle and culture it is argued that few if any bias will exist in the performance of these tests.

Analysis of the Data

The analysis of the data will involve the use of several statistical processes to inform precisely about the intended results. MANOVA statistical analyses will be the primary method of assessing the results. These will establish the differences between the two dependent variables (cognition and affect) and their several levels (inhibition, visual attention, processing speed, working memory; mindfulness, emotional regulation, perceived stress, positive and negative affect) with the independent variables, which will be the brief mindfulness intervention. Within the MANOVA analysis there is also ANOVA analysis to see individual effects of each of the brief mindfulness intervention within the affective measures and also the cognitive ones and T-Test analyses that will also determine the statistical significance of the intervention overall.

Correlations between the measures will also be undertaken in order to associate the variables with each other. Minitab and SPSS software will be used to interpret the results.

Ethics

Ethical standards will follow basic research procedures. First of all, participants will receive an informed consent in which the procedure of the experiment, objectives, and purpose of the study will be stated. Participants will be informed about the nature of the cognitive and affective measures. The informed consent will also indicate that they can withdraw from the study at any time without a penalty and will also inform them about the minimal risks of psychological distress. Furthermore, it will include a description of how the data storage will be confidential and how responses will be completely anonymous. Access to the data is going to be limited to the primary investigator and his respective supervisor. Benefits regarding participation in the study will also be emphasized and contact information will be provided in order to ensure confidence about any question that may arise before, during or after the participation. Signing the informed consent is crucial for the participation in the investigation.

There will be a debriefing session for those participants that would be willing to know more about the nature of the study, the research surrounding it or the topic itself. It is important to follow-up with this session since a purpose of the study is also to generate general interest in psychological research and the topic of mindfulness meditation. Participants will also receive within the informed consent information of how to contact the investigator to receive the results of the study should they be willing to know them.

ANTICIPATED RESULTS

Anticipated results rely strongly on the literature surrounding mindfulness based practices and the benefits relating to meditative practices. It is expected to obtain similar results to those found by Zeidan et al., (2010), reducing stress perceived levels, increasing mindfulness awareness attention and reduced scores in the DERS. This will reflect the nature of the mindful practice overall within the mood elements. Improvement within cognitive measures is also expected to be positive. Less interference in the stroop test and higher levels of sustained attention are the most important findings that will be expected. Increases in WM performance is not expected to be significant since findings from Zeidan et al., (2010) did not find significant results in this measure. Also, processing speed in the TMT will be expected to be moderate if not non significant since there has not been much support for this function to improve.

The study does pretend to have a significant effect size to support the hypothesis that a brief mindfulness meditative practice does have an influence overall in inhibition, switching and visual attention. Changes are expected within the experimental group. Meanwhile, it will be expected that the effects of the control intervention (audiobook listening) will also have an important effect on improving affective processes as measured by the PANAS. This is because the control intervention does involve a relatively relaxed state during the listening of the audiobook. Regarding scale 3 (lack of emotional awareness) and scale 3 (impulse control difficulties) differences across the DERS subscales will be shown since these subscales are related with mindfulness levels. Additionally, obtainment of MAAS higher reports of mindful attention with positive correlations higher levels of sustained attention, visual attention and inhibition are expected.

DISCUSSION

Anticipated results do provide a consistent follow-up with current literature regarding mindfulness and its benefits on cognitive and affective functions. The hypothesis supports the development of brief mindfulness based interventions to increase positive affect, reduce stress and have higher levels of mindful attention. Also, cognitive functions such as visuo-spatial processes, inhibition, switching are reported to improve with the brief intervention. As previously stated few studies have examined the benefits of brief interventions. However, findings go in the line of research such as Zeidan et al., (2010) improving affective and cognitive measures. Several aspects of mindfulness need to be taken into account for the interpretation of the anticipated findings. Consistent reviews and studies have reported general improvement in the development of sustained attention (Chiesa et al., 2011; Chambers et al., 2009), and cognitive flexibility has been correlated with significant self-reported mindfulness in adept meditators (Moore and Malinowski, 2009). Results do extend this piece of evidence towards short-term procedures that still involve the same mechanisms that long-term mindfulness meditation practices possess (Zeidan et al., 2010).

One crucial finding that needs to be interpreted within the framework of previous evidence is the correlations between self-reported positive affect and higher levels of WM, sustained attention and executive functioning. Generally, the ability for self-regulation of emotional reactions has a positive impact within performance in cognitive measures (Austin, 1998, Moore and Malinowski, 2009; Ashby, Isen, Turken, 1999). This could explain the positive correlations between improved affective measures and higher performance on cognitive measures. These findings are crucial because they provide evidence about the

nature of cognitive and affective processes, and how they influence each other. Ashby et al., (1999) provide a solid theoretical neuropsychological model by which this occurs. In this model dopamine levels increase when positive affect is elevated. They assume that during periods of mild positive affect there is simultaneous dopamine release in the mesolimbic system and also in the nigrostriatal system, resulting in the improvement of tasks such as episodic memory recalling, WM, and creative problem solving. Emotional regulation processes require attention that is fundamental to evaluate the situation of self-regulation and induction either cognitive appraisal or expressive suppression of emotional responses (Gross, 2002). This relationship needs to be further explored since there is no clear consensus on how the mechanisms of positive affect might affect cognition overall. Phillips, Bull, Adams, and Fraser (2002) argue that although positive affect may improve cognition, contrasting evidence has stated that concomitant demands on the emotional regulation strategies reduce capacity for cognitive processes. In their experiment they found that being happy resulted in a slower performance in the Stroop test, inhibition and switching faculties where the most impaired with positive affect. Subsequently, contrasting evidence exists to argue about the relationship between positive and higher well-being measures and cognitive performance. In this study, the Stroop performance test was better in the experimental group which was also correlated with positive affect which will support Ashby et al. (1999) neuropsychological model. It is important to remark that emotional states will react with cognition depending upon the tasks, whether this involves spatial or verbal information (Gray, 2001).

Some measures of cognitive performance, such as the WM digit span did not improve overall significantly on the experimental condition. Some research supports this notion on

processing speed tasks. Methodology and the process of the intervention on mindfulness training allow several issues to develop at the moment of obtaining results. As found by Banks et al., (2015) mind wandering and WM did not improve in the experimental condition after one week of training. However, they used an audio-recording induction and training at home that is methodologically different than this study. Still, they may account for the non-improvement that was found in this study, since other studies have supported the notion of enhancement of WM and reduction of mind wandering (Morrison et al., 2014; Mrazek et al., 2013). Overall, findings do support the notion that mindfulness meditation practices enhance cognitive and affective states. The mechanisms by which they do it however, are in need of further research and comprehension. A systematic review of the procedures regarding the format of the intervention need to be taken into account since multiple biases can occur at the moment of interpreting the conclusions and data.

LIMITATIONS

Several limitations need to be taken into account for this study. First, findings can only be generalized for undergraduate students since the sample consisted only of this population. Second, students from USFQ generally belong to a more homogenous, strongly western-based social environment heavily influenced by the United States due to having the American System of education as a method for teaching, this could account for differences across other universities in Ecuador. Another critical limitation of this study is the use of self-report measures that have not been validated in Ecuadorian population. This is fundamental; although bias was reduced with the use of standardized questionnaires from other Latin American countries such as Mexico and Chile. Sample size also was a significant limitation even though Zeidan et al., (2010) findings were generalized to undergraduate population with sample size roughly about the same. Similarly, the control group in this study was also active as the procedure was done according Zeidan et al., (2010) methodology. This could have reduced the effects on mood and positive affect. Cofounding variables as unexpected personal events and physiological processes may have altered also the results of self reported mood and cognition, even though random assignment assumes these differences will remain insignificant.

FUTURE RESEARCH

Possibilities for future research would include the use of a larger and more representative sample size, the use of a more structured Mindfulness meditation based practice and further use of more cognitive and affective measures to deliver more consistent and solid conclusions. This study could serve as a preliminary study for the validation of self-reported mood scales such as the PANAS in Ecuadorian population. Also, for future studies it is recommended the use of a less active control group and to experiment with a single blind procedure to avoid experimenter and expectancy bias towards the results, since double blind procedures would be almost impossible due to the nature of the procedure. Moreover, it would be important to further explore the relationship between self-reported and its impact of cognition. A model in which participants are exposed to emotional stimuli (negative, neutral, positive) and then measured in cognitive performance (Stroop test, WCST, Verbal Fluency, TMT AND WM) could address this issue. Mindfulness could be assessed within a procedure like this one. Other variables such as perceived social support, personality traits, and fluid intelligence could also be added to develop a psychological profile and establish individual differences and their performance in cognitive and affective measures. Finally, assessment of mindfulness as a trait could also be helpful in determining the importance of individual differences within this type of studies.

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APPENDIX B: ETHICS



Comité de Bioética, Universidad San Francisco de Quito
El Comité de Revisión Institucional de la USFQ
The Institutional Review Board of the USFQ

SOLICITUD PARA APROBACION DE UN ESTUDIO DE INVESTIGACION

INSTRUCCIONES:

1. Antes de remitir este formulario al CBE, se debe solicitar vía electrónica un código para incluirlo, a comitebioetica@usfq.edu.ec
2. Enviar solo archivos digitales. Esta solicitud será firmada en su versión final, sea de manera presencial o enviando un documento escaneado.
3. Este documento debe completarse con la información del protocolo del estudio que debe servir al investigador como respaldo.
4. Favor leer cada uno de los parámetros verificando que se ha completado toda la información que se solicita antes de enviarla.

DATOS DE IDENTIFICACIÓN	
Título de la Investigación	Psychological Implications of a brief mindfulness meditation intervention
Investigador Principal <i>Nombre completo, afiliación institucional y dirección electrónica</i>	Erick Paúl Moreno Montenegro, USFQ, emoreno676@gmail.com
Co-investigadores <i>Nombres completos, afiliación institucional y dirección electrónica. Especificar si no lo hubiera</i>	No existen co-investigadores.
Persona de contacto <i>Nombre y datos de contacto incluyendo teléfonos fijo, celular y dirección electrónica</i>	Erick Moreno. 022373-286 092719920 emoreno676@gmail.com / erick.moreno@estud.usfq.edu.ec
Nombre de director de tesis y correo electrónico <i>Solo si es que aplica</i>	Sonja Embree Sembree@usfq.edu.ec
Fecha de inicio de la investigación <i>Diciembre 2015</i>	
Fecha de término de la investigación <i>Marzo 2016</i>	
Financiamiento <i>Personal, no es necesario financiamiento.</i>	

DESCRIPCIÓN DEL ESTUDIO	
Objetivo General <i>Se debe responder tres preguntas: qué? cómo? y para qué?</i>	El presente experimento pretende evaluar si una breve intervención mindfulness tiene un impacto positivo en medidas cognitivas y afectivas. Se utilizará medidas cognitivas estandarizadas (Digit Span, Stroop Test, Verbal Fluency, Trail making Test) y medidas afectivas estandarizadas (Perceived Stress Scale, Difficulties in Emotional

Regulation Scale, Mindfulness Attention and Awareness Scale, Positive Affect Negative Affect Scale). Esto será aplicado a una muestra de estudiantes de la USFQ. El objetivo será evaluar los potenciales efectos del mindfulness en una población universitaria.

Objetivos Específicos

- Determinar la influencia del mindfulness sobre la afectividad y la cognición
- Analizar la influencia de la intervención y sus efectos individuales en cada una de las medidas
- Establecer evidencia para intervenciones breves, practicas y de corto plazo en cuanto a la mejoría en medidas afectivas y cognitivas.
- La hipótesis del experimento pretende verificar si la intervención tiene una influencia positiva en estas medidas.

Diseño y Metodología del estudio *Explicar el tipo de estudio (por ejemplo cualitativo, cuantitativo, con enfoque experimental, cuasi-experimental, pre-experimental; estudio descriptivo, transversal, de caso, in-vitro...) Explicar además el universo, la muestra, cómo se la calculó y un breve resumen de cómo se realizará el análisis de los datos, incluyendo las variables primarias y secundarias..*

En este estudio se propone establecer una comparación de grupos para determinar la influencia positiva de la variable independiente, que es la intervención mindfulness breve, y las variables dependientes que son las diferentes medidas de cognición y afecto. El enfoque del estudio es experimental, por lo cual se utilizará un grupo control y un grupo experimental. También tendrá un enfoque correlacional, pues se pretende establecer correlaciones positivas entre el incremento del desempeño cognitivo y la reducción de afecto negativo, stress y el incremento de mindfulness medido por el MAAS.

El universo son todos los estudiantes diurnos presenciales de la Universidad San Francisco De Quito, se excluyen estudiantes de otras modalidades y de intercambio. De este universo se extraerá una muestra de 65 participantes (n=65) que serán asignados a la condición experimental y la de control según se vayan inscribiendo para participar en el estudio.

Después de realizar las 4 sesiones breves de 20 minutos se tabulará los datos de ambos grupos y se realizará el análisis estadístico respectivo en cuanto a comparación y correlación.

Procedimientos *Los pasos a seguir desde el primer contacto con los sujetos participantes, su reclutamiento o contacto con la muestra/datos.*

Se procederá a realizar un poster o flyer informativo del estudio. Este promocionará el estudio en sí mismo mayoritariamente dentro de las 9 clases de Psicología General (SIC-201), en donde se ofrecerá un extra crédito de 2% por la participación en el estudio. Para esto se conversará personalmente con todos los profesores de aquellas clases solicitándoles este incentivo para la participación. Luego, se registrarán los participantes por semana y les irá asignando de forma intercalada al grupo control y al grupo experimental según se registren. Se convocará a todos los participantes para una sesión informativa en donde tendrán que firmar y aceptar el consentimiento informado para la participación.

Se administrarán los instrumentos cognitivos (Digit Span, Stroop, Trail Making Test, Verbal Fluency) antes de la sesión 1 a ambos grupos. Al finalizar la sesión 4 se les volverá a administrar. En cuanto a las medidas afectivas, se les hará efectuarlas al finalizar cada sesión. La escala de mindfulness (MAAS) será también administrada solo antes de la sesión 1 y al finalizar la sesión 4.

Las sesiones de meditación mindfulness serán administradas por un facilitador con extensa experiencia en meditación. Durarán solamente 20 minutos en los cuatro días que serán administradas. El grupo control, simultáneamente escuchará un audiolibro (Harry Potter) y será supervisado por un asistente o el investigador mismo. Grupos de hasta un máximo de 5 personas recibirán el tratamiento.

Recolección y almacenamiento de los datos *Para garantizar la confidencialidad y privacidad, de quién y donde se recolectarán datos; almacenamiento de datos—donde y por cuánto tiempo; quienes tendrán acceso a los datos, qué se hará con los datos cuando termine la investigación*

Para garantizar la confidencialidad y privacidad de los datos se asignará números a cada una de las hojas de respuesta de los cuestionarios y las medidas cognitivas. La participación es completamente anónima y no se requerirá de nombres o formas de identificación. Solamente para propósito de variables demograficas se recolectará edad, sexo y etnia. Los datos serán guardados bajo llave despues de cada sesión en un cajón de la oficina del supervisor del proyecto. Nadie más tendrá acceso al mismo. Los resultados digitales serán encriptados y la clave solamente la tendrán el investigador y la supervisora. Los resultados se conservarán por alrededor de 2 años. Los participantes tendrán derecho a obtener retroalimentación sobre sus resultados o a optar por negar la utilización de sus resultados despues de la participación.

Herramientas y equipos *Incluyendo cuestionarios y bases de datos, descripción de equipos*

Se incluirán varios cuestionarios estandarizados para medir las dos variables dependientes. Para medir cognición se utilizará:

- Stroop Test (es una medida de inhibición y atención focalizada que mide la interferencia en una tarea de reacción, involucra función ejecutiva)
- Verbal Fluency (es una medida de memoria de trabajo, flexibilidad cognitiva y velocidad de procesamiento que indica funcionamiento ejecutivo)
- Digit Span (es una medida de memoria de trabajo y velocidad de procesamiento. Es un procedimiento estándar de las escalas de inteligencia de Weschler (WAIS)
- Trail Making Test (es una medida de procesamiento de información e iniciación, así como también de procesamiento y atención visual)

Por otro lado, para medir el afecto y el nivel de mindfulness se utilizará:

- Mindfulness Attention Awareness Scale (MAAS). Se utilizará una versión estandarizada en población mexicana, siendo esta la más cercana a la realidad de la muestra ecuatoriana.
- Perceived Stress Scale (PSS). Se utilizará una versión estandarizada en población mexicana.
- Difficulties in Emotional Regulation Scale (DERS): Se utilizará una versión estandarizada en población chilena.
- Positive Affect Negative Affect Scale (PANAS): Se utilizará asimismo una versión estandarizada en población chilena.

JUSTIFICACIÓN CIENTÍFICA DEL ESTUDIO

Se debe demostrar con suficiente evidencia por qué es importante este estudio y qué tipo de aporte ofrecerá a la comunidad científica.

La investigación actual propone que el mindfulness es un modelo de meditación y aceptación de las experiencias internas y externas. Este modelo propuesto en occidente por Kabat Zinn (2003) con los programas Mindfulness Based Stress Reduction (MBSR) pretende ser una intervención de ayuda para poblaciones clínicas y no clínicas en relación a la reducción de estrés, aumento de calidad de vida, disminución de la ansiedad, depresión, manejo del dolor, y en general un mejoramiento del bienestar psicológico (Baer, 2003; Khoury et al., 2015; Kabat Zinn, 2003; Teasdale et al., 2000; Keng et al., 2011).

Las intervenciones mindfulness también ayudan a mejorar el funcionamiento y desempeño cognitivo. Se ha encontrado que existen beneficios en cuanto a mejorar la concentración, atención sostenida, memoria de trabajo, inhibición, interferencia emocional, entre otros (Moore y Malinoswki, 2009; Chiesa et al., 2011; Chambers et al., 2008, Malinowski, 2013; Jha et al., 2007; Lutz et al., 2008; Semple, 2010; Zeidan et al., 2010). No obstante, no se ha observado los efectos de intervenciones breves en poblaciones no clínicas. Por esto es

importante aportar a la comunidad científica y universitaria conclusiones y evidencia con respecto a la efectividad de una breve inducción de mindfulness. De acuerdo con los hallazgos de Zeidan et al., (2010) es importante entonces establecer un diseño de intervención que pueda ser beneficioso para lo estudiantes y que además les provea de una técnica práctica, de corto plazo y sin costo para generar productividad en cuanto a la concentración y atención, así como también un efecto protector en relación a la regulación de afectividad (Zeidan et al., 2010; Banks et al., 2015; Brown & Ryan, 2003; Chambers et al., 2009).

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DESCRIPCIÓN DE LOS ASPECTOS ÉTICOS DEL ESTUDIO

Criterios para la selección de los participantes *Tomando en cuenta los principios de beneficencia, equidad, justicia y respeto*

Se tomarán en cuenta varios requerimientos. En primer instancia todos los participantes tendrán que ser estudiantes a tiempo completo de la universidad, regulares, diurnos y se excluirá a estudiantes de intercambio. No deberá poseer dificultades psicopatológicas al momento de realizar el estudio, y deben encontrarse en el rango de edad de 18 a 25 años. Deben tener disponibilidad a los horarios designados para la participación.

Riesgos *Describir los riesgos para los participantes en el estudio, incluyendo riesgos físico, emocionales y psicológicos aunque sean mínimos y cómo se los minimizará*

Existen mínimos riesgos a tomar en cuenta, especialmente con respecto a desestabilizar o inducir un estado de desregulación emocional por eventos previos o pasados. Para minimizar el riesgo se explicará el propósito del estudio y se asegurará los estándares éticos con respecto a la investigación mediante el consentimiento informado. No existen riesgos físicos para los participantes. Se ofrecerá la posibilidad de una sesión de información después del experimento para discutir de forma más detallada en que consiste el estudio. Asimismo, se ofrecerá servicio de consejería psicológica para quien haya tenido algún malestar.

Beneficios para los participantes *Incluyendo resultados de exámenes y otros; solo de este estudio y cómo los recibirán*

Los beneficios para los participantes son múltiples. En primer lugar, tendrán la posibilidad de beneficiarse del aprendizaje de una técnica y un estado de meditación sumamente práctico. De esta forma podrán incrementar su desempeño cognitivo y mejorar su estado afectivo. En segundo lugar, tendrán información con respecto al tema, lo cual podrá hacer que cada uno busque más información sobre el mismo y mejore su calidad de vida al haber sido introducido hacia el tema. Además, para los participantes de las clases de Psicología General (SIC-201) se les ofrecerá extra crédito para la nota general de su clase. A nivel académico se promoverá la investigación con respecto al mindfulness y a las intervenciones prácticas y breves para poblaciones no clínicas.

Ventajas potenciales a la sociedad *Incluir solo ventajas que puedan medirse o a lo que se pueda tener acceso*

- Se aumentará y estimulará la investigación en la temática del mindfulness y sus potenciales beneficios psicológicos.
- Se comprenderá mejor la relación entre el mindfulness, las funciones cognitivas y la afectividad en un contexto universitario.
- Se expandirá las fuentes de estudios publicados bajo el nombre de la USFQ.
- Se brindará alternativas psicológicas sencillas a aquellos estudiantes del grupo experimental para que puedan mejorar su estado general con este tipo de meditación.

Derechos y opciones de los participantes del estudio *Incluyendo la opción de no participar o retirarse del estudio a pesar de haber aceptado participar en un inicio.*

- Los participantes tienen el derecho a retirarse voluntariamente del estudio en cualquier momento, sin perder los beneficios o ser penalizados.
- Los participantes tendrán el derecho a preguntar y cuestionar cualquier inquietud con respecto al estudio.
- Los participantes tendrán el derecho de obtener sus resultados una vez finalizado el estudio.

Seguridad y Confidencialidad de los datos *Describir de manera detallada y explícita cómo va a proteger los derechos de participantes*

La confidencialidad de los datos será resguardada mediante la colocación de números para cada participante. Se guardarán los datos después de cada intervención en un cajón de la oficina de la supervisora, a la cual solo tienen acceso el investigador y la supervisora. Los datos digitales serán encriptados con una clave de acceso que solo conocen el investigador y la supervisora. El uso de los datos para futuros estudios o para otras cuestiones tendrá que tener permiso de parte del investigador.

Consentimiento informado *Quién, cómo y dónde se explicará el formulario/estudio. Ajustar el formulario o en su defecto el formulario de no aplicación o modificación del formulario*

El consentimiento informado será un documento crucial dentro de esta investigación. Se lo explicará al comienzo de la realización del estudio y se les indicará a los participantes que lo lean detenidamente, si alguno de los participantes desearía retirarse después de leer el consentimiento será libre de hacerlo.

CERTIFICACIÓN:

1. Certifico no haber recolectado ningún dato ni haber realizado ninguna intervención con sujetos humanos, muestras o datos. Sí () No ()
2. Certifico que los documentos adjuntos a esta solicitud han sido revisados y aprobados por mi director de tesis. Sí () No () No Aplica ()

Firma del investigador: _____ (con tinta azul)

Fecha de envío al Comité de Bioética de la USFQ: _____



Comité de Bioética, Universidad San Francisco de Quito

El Comité de Revisión Institucional de la USFQ
The Institutional Review Board of the USFQ

Formulario Consentimiento Informado

Título de la investigación: Psychological implications of a brief mindfulness meditation intervention

Organización del investigador Universidad San Francisco De Quito

Nombre del investigador principal Erick Paúl Moreno Montenegro

Datos de localización del investigador principal 2373486, 0992719920, emoreno676@gmail.com

Co-investigadores N/A

DESCRIPCIÓN DEL ESTUDIO

Introducción (Se incluye un ejemplo de texto. Debe tomarse en cuenta que el lenguaje que se utilice en este documento no puede ser subjetivo; debe ser lo más claro, conciso y sencillo posible; deben evitarse términos técnicos y en lo posible se los debe reemplazar con una explicación)

Este formulario incluye un resumen del propósito de este estudio. Usted puede hacer todas las preguntas que quiera para entender claramente su participación y despejar sus dudas. Para participar puede tomarse el tiempo que necesite para consultar con su familia y/o amigos si desea participar o no. Usted ha accedido voluntariamente a participar en un investigación sobre las implicaciones psicológicas del mindfulness. Puesto que mantiene todos los requisitos es importante que considere su participación de preferencia hasta el final de los procedimientos.

Propósito del estudio (incluir una breve descripción del estudio, incluyendo el número de participantes, evitando términos técnicos e incluyendo solo información que el participante necesita conocer para decidirse a participar o no en el estudio)

El objetivo del estudio es descubrir las implicaciones psicológicas a nivel cognitivo, es decir dentro de pruebas de desempeño de ciertas habilidades mentales simples, y a nivel afectivo es decir con relación al estado de ánimo, de una breve intervención de mindfulness. En este estudio participaran 65 estudiantes de la USFQ. Para conocer las implicaciones los participantes serán asignados a dos grupos. Uno de estos posee la intervención. Se conocerá las implicaciones mediante el uso de cuestionarios que son sencillos de responder y pruebas cognitivas sencillas que se responderán al antes y después de la intervención.

Descripción de los procedimientos (breve descripción de los pasos a seguir en cada etapa y el tiempo que tomará cada intervención en que participará el sujeto)

Los participantes serán asignados a una de las dos condiciones, experimental o control. Posteriormente, se hará llenar los cuestionarios de afectividad antes de cada intervención. Las pruebas cognitivas serán llenadas solamente antes y después de todo el procedimiento. En total se darán cuatro sesiones de 20 minutos por 4 días. Los participantes en ambos grupos deberán permanecer en el procedimiento simultáneamente durante este periodo de tiempo.

Riesgos y beneficios (explicar los riesgos para los participantes en detalle, aunque sean mínimos, incluyendo riesgos físicos, emocionales y/o psicológicos a corto y/o largo plazo, detallando cómo el investigador minimizará estos riesgos; incluir además los beneficios tanto para los participantes como para la sociedad, siendo explícito en cuanto a cómo y cuándo recibirán estos beneficios)

No existen riesgos físicos o económicos asociados a la participación. Existen mínimos riesgos a tomar en cuenta, especialmente con respecto a desestabilizar o inducir un estado de desregulación emocional por eventos previos o pasados. Se ofrecerá la posibilidad de una sesión de información después del experimento para discutir de forma más detallada en que consiste el estudio. Asimismo, se ofrecerá servicio de consejería psicológica para quien haya tenido algún malestar que hubiera podido ser inducido por la intervención y los procedimientos en general.

Existen diversos beneficios en general para los participantes y para la sociedad. Se ofrecerá la posibilidad de obtener un extra crédito de 2% en las clases de psicología general. Además la participación en sí misma podría

Consentimiento informado *(Es responsabilidad del investigador verificar que los participantes tengan un nivel de comprensión lectora adecuado para entender este documento. En caso de que no lo tuvieran el documento debe ser leído y explicado frente a un testigo, que corroborará con su firma que lo que se dice de manera oral es lo mismo que dice el documento escrito)*

mejorar los niveles de atención, concentración, y velocidad de procesamiento, que puede ser útil en el ámbito académico y se puede obtener beneficios psicológicos con respecto a la reducción del estrés y aumento del afecto positivo. En cuanto a los beneficios a nivel social, se estará brindando un estudio íntegro que propone la investigación de intervenciones breves para mejorar la atención y el estado de ánimo en poblaciones no clínicas.

Confidencialidad de los datos *(se incluyen algunos ejemplos de texto)*

Se aplicarán varias medidas de confidencialidad y privacidad para asegurar que los datos se encuentren seguros.

- 1) La información obtenida solo podrá ser accesada por el investigador y la supervisora del mismo. Se asignará un código particular para codificar las respuestas a los cuestionarios y pruebas.
- 2) La participación es anónima y no se requieren de datos que podrían identificarlo individualmente.
- 3) Se guardará los datos recolectados después de cada sesión en el cajón de una oficina bajo llave y los datos digitales serán encriptados con una contraseña de seguridad.
- 4) El Comité de Bioética de la USFQ podrá tener acceso a sus datos en caso de que surgieran problemas en cuanto a la seguridad y confidencialidad de la información o de la ética en el estudio.

Derechos y opciones del participante *(se incluye un ejemplo de texto)*

Usted puede decidir no participar y si decide participar en el estudio puede retirarse a cualquier momento o solicitar al final de su participación que no desea que sus datos sean contados en el estudio. También como participante tiene el derecho a saber de que forma se procesarán los datos o de preguntar cualquier inquietud con respecto a los procedimientos. Tiene también el derecho a pedir sus resultados individuales y los del estudio en general.

Información de contacto

Si usted tiene alguna pregunta sobre el estudio por favor llame al siguiente teléfono 0992719920 que pertenece a Erick Moreno o envíe un correo electrónico a emoreno676@gmail.com

Si usted tiene preguntas sobre este formulario puede contactar al Dr. William F. Waters, Presidente del Comité de Bioética de la USFQ, al siguiente correo electrónico: comitebioetica@usfq.edu.ec

Comprendo mi participación en este estudio. Me han explicado los riesgos y beneficios de participar en un lenguaje claro y sencillo. Todas mis preguntas fueron contestadas. Me permitieron contar con tiempo suficiente para tomar la decisión de participar y me entregaron una copia de este formulario de consentimiento informado. Acepto voluntariamente participar en esta investigación.

Firma del participante	Fecha
Firma del testigo <i>(si aplica)</i>	Fecha
Nombre del investigador que obtiene el consentimiento informado	
Firma del investigador	Fecha

APPENDIX C: INSTRUMENTS

Positive Affect and Negative Affect Schedule (PANAS)

ANEXO 1

Escala PANAS adaptada a Chile

Esta escala consiste en un número de palabras que describen diferentes sentimientos y emociones. Lea cada ítem y luego marque la respuesta adecuada en el espacio próximo a cada palabra, en base a lo que usted siente en estos momentos (es decir, en el momento presente)*. Utilice la siguiente escala para registrar sus respuestas.

* En la versión general se debe sustituir “en estos momentos” y “en el momento presente” por “generalmente” y “en promedio”

1 - muy levemente o nada

2 - un poco

3 - moderadamente

4 - Bastante

5 - extremadamente

- interesado
- molesto
- entusiasmado
- enojado
- fuerte
- culpable
- asustado
- hostil
- optimista
- orgulloso

- irritable
- alerta
- avergonzado
- inspirado
- nervioso
- decidido
- atento
- intranquilo
- activo
- temeroso

Difficulties in Emotional Regulation Scale. (DERS)

These are some statements from the scale. The full use scale with scoring options will be used once obtained.

1. Percibo con claridad mis sentimientos
2. Presto atención a como me siento
3. Vivo mis emociones como algo desbordante y fuera de control
4. No tengo ni idea de cómo me siento
5. Tengo dificultades para comprender mis sentimientos
6. Estoy atento a mis sentimientos
7. Doy importancia a lo que estoy sintiendo .
8. Estoy confuso sobre lo que siento
9. Cuando me encuentro mal, reconozco mis emociones
10. Cuando me encuentro mal, me enfado conmigo mismo por sentirme de esa manera.
11. Cuando me encuentro mal, me da vergüenza sentirme de esa manera
12. Cuando me siento mal, tengo dificultades para completar trabajos
13. Cuando me encuentro mal, pierdo el control.
14. Cuando me encuentro mal, me resulta difícil centrarme en otras cosas
15. Cuando me encuentro mal, me siento fuera de control.
16. Cuando me encuentro mal, me siento avergonzado conmigo mismo por sentirme de esa manera
17. Cuando me encuentro mal, me siento como si fuera una persona débil .
18. Cuando me encuentro mal, me siento culpable por sentirme de esa manera.
19. Cuando me encuentro mal, tengo dificultades para concentrarme
20. Cuando me encuentro mal, tengo dificultades para controlar mi comportamiento
21. Cuando me encuentro mal, me irrito conmigo mismo por sentirme de esa manera.
22. Cuando me encuentro mal, empiezo a sentirme muy mal sobre mí mismo.
23. Cuando me encuentro mal, pierdo el control sobre mi comportamiento .
24. Cuando me encuentro mal, tengo dificultades para pensar sobre cualquier otra cosa
25. Cuando me encuentro mal, mis emociones parecen desbordarse

Perceived Stress Scale (PSS)

Annex

Adaptation of the PSS (14 items) for Mexico [in Spanish]

Marca la opción que mejor se adecúe a tu situación actual, teniendo en cuenta <i>el último mes</i> .					
<i>Durante el último mes:</i>	Nunca	Casi nunca	De vez en cuando	A menudo	Muy a menudo
E1. ¿Con qué frecuencia has estado afectado/a por algo que ha ocurrido inesperadamente?	0	1	2	3	4
E2. ¿Con qué frecuencia te has sentido incapaz de controlar las cosas importantes de tu vida?	0	1	2	3	4
E3. ¿Con qué frecuencia te has sentido nervioso/a o estresado/a (lleno de tensión)?	0	1	2	3	4
E4. ¿Con qué frecuencia has manejado con éxito los pequeños problemas irritantes de la vida?	0	1	2	3	4
E5. ¿Con qué frecuencia has sentido que has afrontado efectivamente los cambios importantes que han estado ocurriendo en tu vida?	0	1	2	3	4
E6. ¿Con qué frecuencia has estado seguro/a sobre tu capacidad de manejar tus problemas personales?	0	1	2	3	4
E7. ¿Con qué frecuencia has sentido que las cosas te van bien?	0	1	2	3	4
E8. ¿Con qué frecuencia has sentido que no podías afrontar todas las cosas que tenías que hacer?	0	1	2	3	4
E9. ¿Con qué frecuencia has podido controlar las dificultades de tu vida?	0	1	2	3	4
E10. ¿Con qué frecuencia has sentido que tienes el control de todo?	0	1	2	3	4
E11. ¿Con qué frecuencia has estado enfadado/a porque las cosas que te han ocurrido estaban fuera de tu control?	0	1	2	3	4
E12. ¿Con qué frecuencia has pensado sobre las cosas que no has terminado (pendientes de hacer)?	0	1	2	3	4
E13. ¿Con qué frecuencia has podido controlar la forma de pasar el tiempo (organizar)?	0	1	2	3	4
E14. ¿Con qué frecuencia has sentido que las dificultades se acumulan tanto que no puedes superarlas?	0	1	2	3	4

Mindful Attention Awareness Scale (MAAS)

There are some of the questions used in this version. Full scoring options of the scale will be used once obtained.

Mexican-Spanish Translation

1. Puedo sentir una emoción y no estar consciente de ella hasta tiempo después.
2. Rompo o derramo cosas por descuido, al no poner atención, o porque estoy pensando en otra cosa.
3. Se me hace difícil permanecer concentrado en lo que está sucediendo en un momento dado.
4. Tiendo a caminar rápidamente para llegar a donde tengo que ir, sin poner mucha atención a lo que ocurre alrededor.
5. Tiendo a no percibir la tensión física o el nivel de incomodidad a que estoy sometido, hasta que realmente son evidentes.
6. Se me olvidan los nombres de las personas, inmediatamente después de que me presentan a alguien.
7. Parece como si estuviera funcionando de manera «automática» sin darme cuenta de lo que estoy haciendo.
8. Me apresuro a hacer mis tareas sin realmente prestarles mucha atención.
9. Me concentro tanto en la meta que quiero alcanzar, que pierdo contacto con lo que estoy haciendo para conseguirla.
10. Realizo trabajos automáticamente, sin ponerle mucha atención a lo que hago.
11. Escucho a mi interlocutor con un oído, mientras hago otra cosa simultáneamente.
12. Llego a un lugar en «piloto automático» y luego me pregunto qué iba a hacer en ese lugar.
13. Me preocupo por cosas que pueden ocurrir en el futuro o por asuntos del pasado.
14. Hago cosas sin ponerles mucha atención.
15. Como entre comidas sin estar consciente de que estoy comiendo.