



**Universitat de les
Illes Balears**

Títol: Mindfulness: a strategy for psychological disorders.

NOM AUTOR: Lluçia Bauzà Servera

DNI AUTOR: 43192535F

NOM TUTOR: Miquel Rafel Tortella Feliu.

Memòria del Treball de Final de Grau

Estudis de Grau de Psicologia _

Paraules clau

Mindfulness, Mindfulness-based treatments, Mindfulness-oriented interventions,
attention.

—
de la UNIVERSITAT DE LES ILLES BALEARS

Curs Acadèmic: 2012-2013

Cas de no autoritzar l'accés públic al TFG, marqui la següent casella:

Abstract

The benefits of Mindfulness meditation practices have been receiving increasing support and growing attention from empirical studies since the last few decades. The present paper reviews the literature about Mindfulness and its uses related to psychological wellbeing. It begins with an explanation about the construct of Mindfulness and how it can be used as a main treatment or as a component of others and evidences about its efficacy. Results show that it is effective in bringing to the patient positive psychological effects, fewer psychological symptoms and a better self-regulation. From these results on that topic, researchers recommend to incorporate Mindfulness practices in clinical interventions in psychology.

It concludes regarding how the relation between Mindfulness training and changes in attentional processes are related to mood disorders and how it could be useful to increase psychological health in patients keeping them aware of the present moment.

Keywords: Mindfulness, Mindfulness-based treatments, Mindfulness-oriented interventions, attention.

Introduction

During the last years, Mindfulness has become a way to treat a huge variety of disorders, physical or psychological. There are different interpretations of Mindfulness depending on the use of it and how it is used. “Mindfulness is understood as paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p.4). The ability to direct our attention in this concrete way can be learnt by practising meditation. In nowadays life, where people do most of their daily routines or activities with the automatic pilot mode, would be useful to provide them with the chance to live the present moment by using Mindfulness taught through meditation. Evidence of the benefits of Mindfulness has increased during the last years. As reported by Chiesa and Serreti (2010); Keng, Smoski and Robins (2011) results from randomized controlled trials are increasingly supporting the efficacy of Mindfulness based interventions for a large number of psychological and physical disorders .

For example, in Axis I disorders, Kabat-Zinn et al, (1992) examined a sample of 22 patients with generalized anxiety and panic disorders, and found significant improvements in several measures of anxiety and depression. Kristeller and Hallet (1999) examined the effects of MBSR on binge eating disorder. It showed statistically significant improvements in several measures of eating mood. Teasdale et al, (2000) examined the effects of Mindfulness- based Cognitive Therapy, for patients with three or more episodes, results showed much lower relapse rates.

As suggested by Chambers, (2009); Garland, (2010) and Hoffman and Asmundson (2008), there is no accord as to how Mindfulness practices help regulate disruptive emotions

In recent years there has been a growing scientific interest in the neurophysiological bases of meditation (Baringa, 2003; Knight, 2004).

“Attention is the most valuable instrument that serves as a telescope which we select, bring into focus, and magnify the stimuli we experience in our world” (Wallace, 1999). How successful individuals are at influencing their attention processes can dictate their subsequent affective experience and behavioral trajectories. Although individual differences exist in the ability to regulate attention, recent literature has suggested that processes involved in attentional regulation can be trained and improved through repeated practice (Lutz, Slagter, Dunne & Davidson, 2008; Rueda, Rothbart, Saccomanno, & Posner, 2007). As attention can be trained, it could help patients suffering from anxiety or depression disorders to focus their attention in here and now instead of in rumination in order to improve their mood. Although not frequently investigated in social psychological research, one type of attention training method, meditative practice, stands out as being particularly promising in improving emotion regulation. (Wadalinge & Isaacowitz, 2011).

The first point of this revision will be the explanation of what Mindfulness is and its origins or roots. As former, Mindfulness-based interventions, were addressed to psychopathological disorders, focused on anxiety and depression, the current review will start on those topics. Then, the use of Mindfulness-based interventions in other pathologies will also be reviewed. Finally, how it has been hypothesized that Mindfulness-based interventions operate on changing attentional abilities and attentional biases.

1. Mindfulness

What is Mindfulness?

Mindfulness involves paying attention to the present moment- let the mind welcome all our thoughts, including these that are not nice such as anger or pity, in order to strengthen our heart and suffer. That is the way to realize what is going on in our minds right now- without judging things and let them be as they are at a given moment. - not judging if our experiences are good or bad, trying not to get upset because of your feelings, just accept and if we judge, then let the feelings go -.

It involves purposefully expanding your attention to take in both what you are experiencing inside, thoughts, feelings and physical sensations. It also involves bringing a gentle and honest curiosity to your experiences with a fresh perspective. “Mindfulness involves being able to accept, and even welcome, what can’t be changed, rather than struggling to control things beyond our control” (Orsillo & Roemer, 2011 p. 81). Mindfulness has its origins in Buddhist traditions, that are rooted themselves in earlier Hindu beliefs and practices. This word derives from Pāli word *sati* which can be originally found in the *Abhidamma* (Kiyota, 1978) and later in the *Vishuddimagga* (Buddhaghosa, 1976). Historically Mindfulness has been called “the heart” of Buddhist meditation (Thera, 1962). The contribution of Buddhist traditions has been in part to emphasize simple and effective ways to cultivate and refine this capacity and bring it to all aspects of life. Mindfulness received its development within the Buddhist traditions and teachings as well, approaches that can be of great value for refining one’s own practice. (Tolle, 1999). As stated by Kabat-Zinn, Mindfulness is often spoken as

synonymously as insight meditation, which means a deep, penetrative non-conceptual seeing into the nature of mind and world.

Unfortunately classical descriptions of Mindfulness are usually somewhat poetic and abstract and they do not easily lend themselves to a scientific operationalization that could be used for scientific purposes on this topic. Several authors have recently attempted to provide psychologically oriented definitions of Mindfulness designed to overcome the difficulties related to early conceptualizations, emphasizing at least two points. The first one is referred to a full attention to internal and external experiences as they occur in the present moment (Bishop et al., 2004; Brown & Ryan, 2003; Kabat-Zinn, 1994). The second component is usually described as a particular attitude characterized by non judgment of, and openness to, current experience (Bishop et al., 2004; Brown & Ryan, 2003; Kabat-Zinn, 1994) which is supposed to lead to higher levels of exposure to negative stimuli and emotions (Kabat-Zinn et al., 1992) as well as to higher acceptance (Brown & Ryan, 2004; Hayes, 1994) and concurrent reduction of experiential avoidance (Hayes et al., 2004).

2. Interventions based on Mindfulness

The concept of Mindfulness was introduced to psychology more than twenty years ago. It has been applied to diverse areas such as, psychopathology, developmental psychology, attention processes, or education, for example. During these years it had been developing some different ways of uses that are varieties from the original one. In addition, other psychology interventions had added Mindfulness as one more of its components.

First of all, we are going to review the basic characteristics from Mindfulness based interventions: Mindfulness -based Stress Reduction (MBSR) or Mindfulness-based cognitive therapy (MBCT) and secondly, we are going to mention psychological programs that include Mindfulness as one more of its components.

2.1 Mindfulness-based Stress Reduction.

MBSR is a group-based behavioral intervention that was created by Jon Kabat-Zinn in 1979 which was developed with the aim of decrease stress levels from people suffering from anxiety. He founded the Stress Reduction Clinic at the University of Massachusetts. This foundation rests on the idea of distress and suffering results from wanting things in a different way from what they are (wishing to be healthy, waiting something, thinking about past...)

As reported by Salmon, Santorelli, Sephton & Kabat-Zinn, (2009) MBSR programs have changed in the last years and nowadays are offered in many hospitals and clinics as part of a way of health care.

The motivation of participating in these programs is motivated by the wish of change that advocates patience, self-trust and acceptance. Suffering understood in MBSR's perspective is different from the medical meaning. In MBSR, is understood as a sense of estrangement from oneself and present circumstances while in the medical meaning it refers to the physical pain.

MBSR takes the form of an eight-session-weekly group program of two hours or two hours and a half. The one who is teaching approaches stress management by helping

participants cultivate a “here and now” attention in order to cope with challenging events or circumstances in their lives. It also includes an all-day intensive Mindfulness session.

Some Mindfulness meditation skills from Buddhism integrated with Western psychology are taught: The body scan that is a 45 minute exercise in which attention is directed to different areas of the body, realizing of each sensation in each part of the body while the participant is lying on the floor with his eyes closed. Also Hatha Yoga is taught, to realize on the body sensations during soft movements and breathing. Finally, in sitting meditation participants are sitting in a relaxed way focusing their attention on their sensations of breathing.

Each practice of them encourages Mindfulness exploration of specific facets of experience: somatosensory – body scan- , kinesthetic (Hatha Yoga) and cognitive (sitting meditation) (Herbert & Forman 2010, p. 135)

Following Salmon, Sephton & Dreeben (2011) this meditation is incorporated into the daily home practice of approximately one hour of duration. All these information are recorded in CD’s to provide a guidance that could be used whenever and wherever the person is. After a few weeks of practicing, participants are encouraged to practice without these CD’s. MBSR program has formal practices and informal ones. The formal practices are referred to as the body scan, Hatha Yoga and sitting meditation understood as a regular practice, that means a daily practice. On the other hand, informal practices are those directed to real experiences in our lives like driving, walking, having a shower or working. Trying to pay attention to them we will assimilate Mindfulness in life.

MBSR has been mainly used as an intervention to increase the well-being. It is shown that MBSR is also effective in helping chronic pain and fatigue, depression, anxiety, life stress, psoriasis, cancer and in supporting self-care for example.

Does MBSR work?

Carlson, Speca, Patel, and Goodey, (2002), investigated the relationship between a Mindfulness-based stress reduction meditation program for early stage breast and prostate cancer patients and quality of life, mood states, stress symptoms, and levels of cortisol, dehydroepiandrosterone-sulfate and melatonin. 58 and 42 patients were assessed pre- and post-intervention, respectively. Significant improvements were seen in overall quality of life, symptoms of stress, and sleep quality. No significant improvements were seen in mood disturbance. MBSR program enrollment was associated with enhanced quality of life and decreased stress symptoms in breast and prostate cancer patients.

A meta-analysis by Grossman, Nienmann, Schmid, and Walach, (2004), about studies covering a wide spectrum of clinical populations -e.g., pain, cancer, heart disease, depression and anxiety-, as well as stressed nonclinical groups were included in this meta-analysis. The conclusion was that although derived from a relatively small number of studies, the results suggested that MBSR may help a broad range of individuals to cope with their clinical and nonclinical problems.

2.2 MBCT

Zindel Segal, Mark Williams and John Teasdale, (1991) developed the Mindfulness-based Cognitive Therapy (MBCT) which is based on MBSR created by Jon Kabat-Zinn.

The main use of MBCT is to help people who suffer from depression, chronic unhappiness or to prevent relapse of major depressive episodes. It is useful because of the attention based on control skills that are taught in this program.

As stated by Fresco, Flynn, Mennin & Haigh, (2011) Mindfulness-based cognitive therapy – MBCT- is based in MBSR and it also incorporates elements from cognitive-behavioral interventions. The skills that are taught in MBCT such as attention control from the meditation roots are helpful to depressive relapse. People who suffer major depressive episodes are susceptible to recurrences because of the non adaptive thoughts that they have.

“The goal of the program is for patients to develop an awareness of, and to respond more effectively to, negative thinking patterns such as avoiding unwanted thoughts, feelings, and bodily sensations” (Ma & Teasdale, 2004).

MBCT is an eight-week group program where up to twelve depressed patients take part. The Mindfulness skills aim to help patients to observe and accept their thought and feelings without judging them.

The therapy starts by identifying the negative automatic thinking characteristic of people who suffers from depression. During the second session, patients are encouraged to understand the reactions they have to experiences in life and to Mindfulness experiences more specifically. In the third session, breathing techniques are taught in order to focus attention on the present moment. During the fourth session, experiencing the moment without becoming attached, aversive or bored is presented as a way to prevent relapse. In session five is used to promote acceptance of one’s experience without holding on. Session six is used to describe thoughts as “merely thoughts”. In the

final sessions, participants are taught how to take care of themselves, to prepare for relapse and to expand their Mindfulness practice to everyday life. (Fresco, Flynn, Mennin & Haigh, 2011)

The importance of MBCT relates to high levels of depression suffered by women during some time of their life. Around 12% of men and 20% of women will suffer major depression at some time of their life and each episode of depression increases the chances that the person will experience another episode by 16% (Teasdale & Kabat-Zinn, 2007)

Does MBCT work?

National Institute of Health and Care Excellence has validated MBCT as an effective treatment for prevention of relapse. Individuals who have been clinically depressed three or more times discovered that learning these skills helps to reduce considerably their chances of relapse.

In the first work by Teasdale, Segal, Williams, Ridgeway, Soulsby and Lau, (2000). MBCT was evaluated in recurrently depressed. The patients (n= 145) were randomized to continue with treatment as usual or, in addition to receive MBCT. For patients with 3 or more previous episodes of depression (77% of the sample), MBCT significantly reduced risk of relapse/recurrence. For patients with only 2 previous episodes, MBCT did not reduce relapse/recurrence.

More recently, Williams, Crane, Barnhofer, Fennell, Duggan, Hepburn and Goodwin (2008), aimed to explore the benefits of MBCT for people with bipolar disorder focusing on between-episode anxiety and depressive symptoms. The results suggest that

MBCT led to improve immediate outcomes in terms of anxiety which were specific to the bipolar group. Both bipolar and unipolar participants allocated to MBCT showed reductions in residual depressive symptoms relative to those allocated to the waitlist condition.

3. Interventions that incorporate Mindfulness

As stated before, beyond MBSR and MBCT, several psychological interventions are increasingly incorporating Mindfulness components in their protocols. The principal ones are going to be revised.

3. 1 Dialectical behavior therapy

Following Robins & Rosenthal, (2011) Dialectical behavior therapy (DBT) is a therapy which is efficient with a range of disorders such as borderline personality disorder. Linehan developed this treatment program to change behaviors, emotions and thoughts. Patients are encouraged to accept themselves or their lives as they are, that is to say in a no judgmentally way.

Patients with BDP, have troubles to cope with situations that are lived as difficult and that are related to emotional distress, and often are harshly judgmental and non-accepting themselves and / or other people. Acceptance can be useful because it reduces suffering that results from cyclic thoughts about one's situation (that is to say, in a judgmentally way). Mindfulness skills are taught in DBT to help them to develop greater acceptance of self, others or life in general. Many of these skills and treatment strategies have roots in Buddhist principles and Mindfulness meditation practices.

The ones that are taught to patients are: being mindful of the current moment (live the present), seeing reality without delusion or accepting reality without judgments.

These skills are beneficial for emotion regulation and are taught in DBT because of their potential for clinical benefits that can include: being less distractible, being more aware of and able to let go of rumination, being more aware of action urges before acting on them, and being able to experience life more fully and richly. (Robins & Rosenthal)

There are four modes of treatment in DBT: individual therapy, group skills training, telephone consultation between therapist and patient and consultation team meetings for therapists. Mindfulness skills are taught in the context of the skills- training group as a way of helping patients increase self-acceptance, and as an exposure strategy aiming to reduce avoidance of difficult emotion and fear responses (Linehan, 1993).

Does DBT work?

Lynch, Trost, Salsman and Linehan, 2007; Robins and Chapman, 2004, found that standard outpatient DBT is more effective than TAU or another active treatment in reducing frequency and severity of parasuicidal and self harm behavior among individuals with BDP and in reducing substance use disorders (Linehan et al., 1999, 2002). Among studies that included follow-up assessments, the effects of DBT were found to last for up to one year on the following outcome measures: number of parasuicidal behaviors, global functioning, social adjustment, and use of crisis services (Linehan et al., 1991, 1993, 1994, 1999, 2006). Finally, modifications of DBT have been found to be effective in binge eating disorder (Telch et al., 2001) bulimia (Safer et al., 2001), and chronic depression in the elderly (Lynch et al., 2003).

DBT has a strong Research Support from American Psychological Association, used for BDP.

Following Linehan, (1993); and Robins, (2002) the component of Mindfulness in DBT is useful due to the help that provides to patients to improve their emotion regulation abilities and increasing self-acceptance.

3.2 Acceptance and commitment therapy

Acceptance and Commitment therapy (ACT) is a contemporary member of the general family of cognitive behavior therapies (Wilson, Bordieri, Flynn, Lucas & Slater, in press) It was developed based on the premise that psychological distress is often associated with attempts to control or avoid negative thoughts and emotions, which often paradoxically increase the frequency or intensity of these internal events. (Hayes et al., 1999).

ACT is a process-oriented model which is formed by six core processes but we are only going to pay attention to the two which are related to Mindfulness: contact with the present moment and acceptance.

As stated by Wilson, Bordieri, Flynn, Lucas & Slater, (2011) Troubles with the present moment processes can cause many psychological difficulties such as worry or rumination where the patient is thinking about future or past. It impedes its present moment process. In order to focus the attention in the present moment the therapist can teach formal or informal Mindfulness skills like noticing emotions, bodily state and cognition through breathing exercises, body scan or Hatha yoga.

“Treating experiential avoidance involves acceptance-oriented interventions aimed at helping the client to open up psychologically to difficult experiences” (Herbert, Forman & England, 2009).

Exposure strategies fit well in this, also interventions about increasing acceptance and making contact with the consequences of no acceptance involve metaphors, including some physical metaphors, Gestalt-like experiential exercises, and acceptance oriented meditations, for example. (McGinn, Benson & Christensen, in press)

Does ACT work?

It has been studied the efficacy of ACT in treating a range of mental health outcomes, including those associated with depression, anxiety, impulse control disorders, schizophrenia, substance abuse and addiction and workplace stress (Hayes et al., 2006; Powers, Zum Vorde Sive Vording & Emmelkamp, 2009). Specifically, ACT has been found to be more effective than TAU in improving affective symptoms, social functioning and symptom reporting, and lowering rehospitalization rates and symptom believability among psychiatric inpatients with psychotic symptoms (Bach & Hayes, 2002; Gaudino & Herbert, 2006).

ACT has been shown to be effective at reducing substance use and dependence among nicotine-dependent (Gifford et al., 2004) and polysubstance-abusing individuals (Hayes et al., 2004).

Finally, there is preliminary evidence indicating the effectiveness of ACT in treating trichotillomania (Woods et al., 2006).

ACT has a Strong Research Support from the American Psychological Association used for Chronic Pain. It has Modest Research Support for Depression, Mixed Anxiety, Obsessive-Compulsive Disorder and finally for Psychosis where it does not directly reduce psychosis symptoms, it improves the ability to cope with them and to reduce distress associated with them.

Following Baer (2003) the component of Mindfulness in ACT is useful due to the treatment processes taught in ACT are such as acceptance and contact with the present moment. A variety of exercises to enhance awareness and acceptance are the basis of Mindfulness practices. Although ACT does not incorporate Mindfulness exercises, its focus on helping patients cultivate present –centered awareness and acceptance.

3.3 Integrative behavioral couple therapy

Integrative behavioral couple therapy (IBCT) was developed by Neil Jacobsen and Andrew Christensen in the early 1990s. IBCT addresses couples distress by acceptance and change of each partner's behaviors. It encourages empathizing with the partner and responding in an accepting way. Here is where a strategy taught in Mindfulness is included although it is not instructed during the IBCT, moreover it doesn't encourage to one's acceptance, it encourages on others' acceptance.

Traditional behavior couple therapy (TBCT) has been using behavioral techniques to alter couple distress since the 1960's but Jacobson & Christensen began to consider that TBCT should be improved because it was not as effective as it was supposed to be. So, one of their primary emphasis was on helping partners to accept their partner. Both had found in their clinical practice that conflict over change often masked feelings of hurt and pain (Jacobson & Christensen, 1996). Following McGinn, Benson & Christensen

(2011) Acceptance skills allowed couples to cope with their difficulties besides changing some patterns on the relationships. It is important to note that this does not mean couples are expected to accept the status quo of their relationship (Jacobson & Christensen, 1996). Acceptance in IBCT means to appreciate and care for each other more.

Does IBCT work?

Jacobson, Christensen, James Cordova and Eldridge, (2000). suggested that the results of a preliminary clinical trial in which 21 couples were randomly assigned to Traditional behavioral couple therapy o (TBCT) or to IBCT indicated that therapist could keep the 2 treatments distinct, that both husbands and wives receiving IBCT evidenced greater increases in marital satisfaction than couples receiving TBCT, and that IBCT resulted in a greater percentage of couples who either improved or recovered on the basis of clinical significance data.

Besides, Christensen, Wheeler, Baucom, and Simpson, (2004). TBCT and IBCT on 134 seriously and chronically distressed married couples, stratified into moderately and severely distressed groups. Couples in IBCT made steady improvements in satisfaction throughout the course of the treatment, whereas TBCT couples improved more quickly than IBCT ones. Both treatments produced similar levels of clinically significant improvement by the end of the treatment (71% of IBCT couples and 59% of TBCT were reliably improved or recovered) Measures of communication also showed improvement for both groups. Measures of individual functioning improved as marital satisfaction improved.

Nothing about IBCT appears in APA.

The component of Mindfulness used in IBCT is the acceptance, not only self-acceptance, also encouraging others' acceptance – couple in this case- .

Treatment protocols, many for emotion distress are increasingly incorporating some aspects of Mindfulness practices. As in those above, Mindfulness practices that are introduced are based on acceptance, contact with the present moment, emotion regulation abilities and enhanced awareness. Cultivating these practices promotes lessening discomfort and regulates attention strategies that are highly related to mood disorders.

4. Mindfulness related to attention.

As seen along the review, Mindfulness has a high importance in attentional processes. Mechanisms related to attention are changed when Mindfulness practicing. People suffering mood disorders, show a low capacity to move away their attention from signals that are not coming from the task they are making even if it has not emotional baggage. All these dysfunctions could be the basis for the problems in the emotional regulation that are shown in people who suffer from anxiety as well as depression disorders and every time more are more evident to be the central element for the origin and support of these problems.

The negative affectivity is understood as a tendency to experiment some negative moods as fear, sadness, fault or hostility in different situations. This negative affectivity that is related to suffering from discomfort is shown in anxiety troubles as in depressive troubles also. People who suffer from high levels of negative affectivity are riskier to experience an emotional disorder because they have lower activation borders

that allow anxiety processes to begin, with more force and they have problems to recover from negative emotions too.

Emotional regulation is understood as the ability to modulate activation and discomfort, so this is what manages the negative affectivity. It is thought that the aim of anxiety disorders is the failure to inhibit or extinguish bad feelings in an effective way.

Negative affectivity determines the tendency to use different types of strategies that are no correct, so attentional biases, focused on threat are one of the basic processes in anxiety disorders. These biases are the basis for anxiety disorders. The difficulties are present both in non threatening stimuli as in threatening stimuli.

Attentional biases are shown in all anxiety disorders and also in depression as well as in people who presents high negative affectivity. Therefore attentional biases are an important fact in presenting high levels of anxiety that could come from high levels from negative affectivity. The capacity of attentional control would be the mechanism that could be in the middle of problems in moving away attention” (Eysenk et al, 2007: Eysenck & Derakshan, 2011).

Emotional regulation refers to some mental strategies that are used in order to modify responses such as fear, anxiety or emotional discomfort. These strategies are divided in two different types: the ones that are adaptable – acceptance, distance or solving solutions – and the others that are the non-adaptable such as rumination. Rumination is understood as a cognitive activity in which the person focuses his or her attention on its own distress symptoms and its causes and consequences but never on ways to solve the trouble. Rumination always refers to the past.

Implication in non- adaptable emotional regulation strategies is related to presence and development of psychopathologic disorders, more concretely in emotional disorders.

It is important to take into account that the presence of high levels of negative affectivity determines in high dimensions implication in non adaptable regulation strategies above all in rumination.

Attentional processes are the basis for emotional regulation and are modulated by temperament and negative affectivity

Attentional biases are present in anxiety and depression disorders in a concrete way much as in others: problems when removing attentional resources.

People suffering from anxiety are more attentive to threatening stimuli and they find it more difficult to remove their attention to them than people who don't suffer from these problems. There is evidence about people with anxiety disorders have troubles in inhibition from attention and also in threatening stimuli. This stage of information processing seems to be particularly as an important etiologic factor and maintenance of anxiety disorders and emotional whole. According to this, many experts in the field consider the type of attentional bias leading to more anxiety.

Following Bishop (2007), as well as the dorsolateral prefrontal cortex, probably another brain area is involved such as the anterior cingulated cortex.

Works based on techniques such as electroencephalographic on neuroimaging (e.g. Ochsner et al., 2009, Ochsner & Gross, 2007; Johnstone et al., 2007; Wager et al., 2008) suggest that increased activity of the prefrontal cortex would be crucial for the modulation of negative emotions and reflect the resilience spontaneous adversity (Ochsner & Gross, 2007; Davidson, 2004; Davidson, Fox, & Kalin, 2007).

Hartley and Phelps (2010) suggest that cognitive emotion regulation in the cortex dorsolateral prefrontal cortex regulates the expression of fear through projections to the prefrontal ventromedial prefrontal cortex, which in turn inhibits the activity of the amygdale, as already mentioned before. The coupling between the amygdale and the prefrontal cortex is thus a key element to determine the capacity to regulate negative emotions.

4. 2 Mindfulness and observable changes in neural circuits related to attentional training.

As stated above, meditation is a body and mind self regulating practice that focuses on training attention in order to bring mental processes under greater voluntary control. Accumulating evidence shows meditation-related changes either as state (short-term) or trait (longer-term) (review Cahn and Polich, 2006).

It was shown to induce neuroplasticity in brain function (Davidson & Lutz, 2008) as well as structure (Hölzel et al., 2011).

Mindfulness among other meditation practices, affects self-referential processing, as the major aim of practice is the realization, by direct experience, of the lack of any essential “self” (Dreyfus & Thompson, 2007).

Default Mode Network implicates prefrontal cortex, the medial temporal lobe – hippocampus and parahippocampal gyrus-posterior lateral cortices, anterior and posterior cingulated cortex (ACC, PCC) and precuneus, was shown to be active when individuals are engaged in internal processing, and to deactivate when attention shifts toward external stimuli (Raichle et al.,2001).

Different types of meditation training such as Mindfulness, changes DMN activity shown by functional magnetic resonance imaging. In Mindfulness trained participants, meditation resulted in a reduction in the medial prefrontal cortex activity, and increased engagement of a right lateralized network, comprising the lateral prefrontal cortex and viscerosomatic areas such as the insula, secondary somatosensory cortex and inferior parietal lobule (Berkovich-Ohana, Glicksohn & Goldstein, 2011). Following Bishop, (2007). Neuroimaging studies (...) indicate that there is a neural circuit that is crucial common of the operation cognitive-affective domains. Both the amygdale (the increased activation) and cortex (with reduced activity) are central to this circuit. The reduced activity of the dorsal and medial prefrontal cortex is associated with a reduced ability to regulate the outcome of attentional processes, assessment and association signals switched to stimulate potentially related to the threat.

Other fMRI studies showed, on the contrary, meditation-induced increased activity within the Default Mode Network. Hötzel et al. (2007) reported increased activity within the medial prefrontal cortex and ACC in Mindfulness practitioners compared to controls while comparing meditation to a mental arithmetic task.

Default Mode Network plasticity is induced by Mindfulness as neuroimaging studies show although more studies are needed.

Two main conceptions of Mindfulness could be hypothesized about how Mindfulness regulates emotion, as a top down strategy or as a bottom up strategy.

The first one is if Mindfulness could be understood as paying attention to the present moment without judging things and let them be as they are in a given moment, it would be a bottom-up process. So, accordingly, its training should be associated to reduced

activation of limbic regions (amygdale and striatum) in response to emotionally salient stimuli without concomitant activation of PFC areas, particularly dorsolateral, ventrolateral and OFC (Chambers et al., 2009, Gyurak et al., 2011). The second conception is that gamma power increase has been related to activity in the prefrontal node of the Default Mode Network (Chen et al., 2008; Mantini et al., 2007) which is closely related to self-referential processing (Northoff and Bermpohl, 2004; Northoff et al., 2006). Gamma oscillations are typically related to top-down attention processes (Hermann et al., 2010) while meditation was frequently shown to increase activity in the theta and alpha rhythms (reviewed by Cahn and Polich, 2006; Ivanovski & Malhi, 2007; Rubia, 2009).

Another study reported increased gamma power over parieto-occipital sites during Mindfulness compared to resting state in expert practitioners. This effect was enhanced with practice proficiency. (Cahn et al., 2010)

The majority of studies suggest that the significant role of Mindfulness training in the reduction of activation of cortical midlines structures previously associated with the DFM, probably reflecting the reduction of self-referential processing associated with Mindfulness practice. A large number of studies ranging from clinical to neuropsychological and neurobiological studies further support one of this view, making it difficult to draw definitive conclusion as to whether Mindfulness training is better conceptualized as a top-down or a bottom-up process (Chiesa, Serretti & Jakobsen, 2012).

Discussion

The aim of this paper was to review literature about Mindfulness and its uses related to psychological disorders as how it changes neural circuits related to attentional processes. The main objectives were to describe the concept of Mindfulness, its uses and efficacy as an intervention based on it, or in interventions that include it and finally to explain how this attention training process is helpful in emotional disorders . I decided to review this topic due to the fact that it is a growing field in psychology that the mean future would acquire more acknowledgement than it has nowadays. As it is a relatively new treatment or use in Psychology, more standardized studies are needed to replicate findings to reduce discrepancies among different Mindfulness protocols, then, it would be interesting to replicate this review in a few years, in order to guess if at the present time we are right about the results which we have.

In spite of the consistent methodological shortcomings and some discrepancies between definitions of Mindfulness and different applications based on a review of literature across multiple articles and methodologies, this review concludes that Mindfulness and its cultivation helps and improves psychological functioning used as an intervention based on it – MBSR or MBCT- or in interventions that include it – DBT, ACT or IBCT-

Even though, in every article or review read report that further studies are needed in Mindfulness due to its early stage, a construct that has its origins in Buddhism and has a short story in our Psychology; it is a challenge to define, or to quantify it. As said before, there are authors considering Mindfulness as a one-dimensional construct, referred to a full attention to internal and external experiences as they occur in the present moment (Bishop et al., 2004; Brown & Ryan, 2003; Kabat-Zinn, 1994). The

second component is usually described as a particular attitude characterized by non judgment of, and openness to, current experience. A collaborative meaning of Mindfulness, clearer and more specific may appear in order to evaluate the same aspects in every study. Mindfulness results are being assessed by self-reports that correspond with daily life, future research should expand in evaluating Mindfulness to include methods different from self-report questionnaires. Studies comparing Mindfulness training to a waiting list which does not account for non specific effects of Mindfulness training, heterogeneity in the types of Mindfulness practiced as well in their duration or variations in study design in order to support its effectiveness.

There is a clear convergence of findings that suggest that Mindfulness practices correlates with well being in psychological disorders. These findings are tested with EEG, which identifies changes in brain function.

Results shown in different investigations related to attention are consistent with the point of view that Mindfulness training may coach attention in specific ways, attention is central to many higher order cognitive operations related to mood disorders (anxiety and depression) so, improving attentional systems with training methods as Mindfulness, has to be potentiated in many areas. Individuals, who are capable to do this, would experience more positive emotions that would improve their attentional systems. As read along the review, one of the most optimistic ways to achieve this regulation is improving meditative practices that teach their attentional processes.

Researchers have informed that the results are promising in pilot trials of Mindfulness interventions for: attention deficit hyperactivity disorder (Zylowska et a., 2008), panic disorder (Kim et al., 2010), generalized anxiety disorder (Craigie, Rees, Marsh and

Nathan, 2008; Evans et al., 2008; Roemer, Orsillo and Salters-Pedneault, 2008), psychosis (Chadwick, Taylor and Abba, 2005) and alcohol and substance use problems (Bowen et al., 2006; Witkiewitz et al., 2005).

In the future, investigation must go on exploring latent uses of Mindfulness, practical issues related to cost effectiveness and types of training as long as types of trainers, with purpose of reduce suffering in disorders as in people not suffering from any disorder to increase their welfare.

References

- Baer, R., Smith, G., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J., (2008) Construct Validity of the Five Facet Mindfulness Questionnaire in Meditating and Nonmeditating Samples. *Assessment* V15, N3 329-342.
- Baer, R. (2003) Mindfulness Training as a Clinical Intervention: A conceptual and Empirical Review. *Clinical Psychology: Science and practice*, V10 N2.
- Baer, R., Smith, G., Hopkins, J., Krietemeyer, J., & Toney, L. (2006) Using Self-Report Assessment Methods to Explore Facets of Mindfulness. *Assessment* V13 N1 27-45
- Berkovich-Ohana, A., Glicksohn, J., & Goldstein, A. (2012) Mindfulness- induced changes in gamma band activity- Implications for the default mode network, self-reference and attention. *Clinical Neurophysiology* 123, 700-710.
- Bishop, S., Lau, M., Shapiro, S., Carlson, L., Anderson, N., Carmody, J., Segal, Z., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004) Mindfulness: A Proposed Operational Definition. *Clinical Psychology: Science and Practice* V11 N3.
- Carlson, L., Speca, M., Patel, K., & Goodey, E. (2004) Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress and levels of cortisol, dehydroepiandrosterone sulfate (DHEAS) and melatonin in breast and prostate cancer. *Psychoneuroendocrinology*, 29, 448-474.

- Chiesa, A., Calati, R., & Serretti, A. (2011) Does Mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review*, 31, 449-464.
- Chiesa, A., Serretti, A., & Jakobsen, J. (2013) Mindfulness: Top-down or bottom-up emotion regulation strategy? *Clinical Psychology Review*. 33, 82-96
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004) Mindfulness-based stress reduction and health benefits A meta-analysis. *Journal of Psychosomatic Research* 57, 35-43.
- Fresco, M., Flynn, J., Mennin, D., & Haigh, E. (2011) Mindfulness-Based Cognitive Therapy. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P 57-83.
- Herbert, J., & Forman, E., (2011) *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. New Jersey: Wiley.
- Herbet, J & Forman, E. (2011) The evolution of Cognitive Behavior Therapy: The Rise of Psychological Acceptance and Mindfulness. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P 3-25.
- Hofmann, S., Glombiewski, J., Asnaani, A., & Sawyer, A. (2011) Mindfulness and Acceptance: The Perspective of Cognitive Therapy. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P 267-291

- Jha, A., Krompinger, J. & Baime, M. (2007) Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience* 7(2) 109-119.
- Kabat-Zinn, J. (2003) Mindfulness- Based interventions in Context: Past, Present, and Future. *American Psychological Association* V10, N2.
- Keng, S., Smoski, M., & Robins, J. (2011) Effects of Mindfulness on psychological health: A review o empirical studies. *Clinical Psychology Review*, 31, 1041-1056.
- Kristeller, J., Wolever, R. (2011) Mindfulness-Based Eating Awareness Training for Treating Binge Eating Disorder: The conceptual Foundation. *Eating Disorders*, 19:49-61.
- McHuhgh, L., Simpson, A., & Reed, P. (2010) Mindfulness as a potential intervention for stimulus over-selectivity in older adults. *Research in Developmental Disabilities* 31 178-184
- National Institute for Health and Care Excellence. (2013) *Therapeutic Procedures*. Retrieved 31 May, 2013, <http://www.nice.org.uk/guidance/index>.
- Orsillo, S., & Roemer, L., (2011) *The Mindful Way through Anxiety. Break Free from chronic worry and reclaim your life*. New York: Guilford.
- Proulx, K. (2008) Experiences of Women with Bulimia Nervosa in Mindfulness-Based Eating Disorder Treatment Group. *Eating disorders*, 16:52-72

- Robins, C., & Rosenthal, M. (2011) Dialectical Behavior Therapy. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P. 164-193.
- Roemer, L., Orsillo, S. (2003) Mindfulness: A Promising Intervention Strategy in Need of Further Study. *American Psychological association* D12
- Salmon, P., Sephton, S., & Dreeben, S. (2011) Mindfulness-Based Stress Reduction. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P. 132-164.
- Society of Clinical Psychology. American Psychological Association, Division 12. (2013). *Treatments*. Retrieved May 31, 2013, from <http://www.psychologicaltreatments.org/>
- Soler, J., Valdepérez, A., Feliu-Soler, A., Pascual, J., Portella, M., Martín-Blanco, A., Alvarez, E., Pérez, V. (2012) Effects of the dialectical behavioral therapy- Mindfulness module on attention in patients with borderline personality disorder. *Behaviour Research and Therapy* 50, 150-157.
- Teasdale, J., Segal, Z., Williams, J., Ridgeway, V., Soulsby, J., & Lau, M. (2000) Prevention of Relapse / Recurrence in Major Depression by Mindfulness-Based Cognitive Therapy. *American Psychological Association* V 68, N4 615-623.
- Tortella Feliu M., (2013). *Psicopatologia dels trastorns d'ansietat i afectius*. Retrieved May 20, 2013 from <http://tortella.ndpc.cat>
- Wadlinger, H., & Isaacowitz, D. (2011) Fixing Our Focus: Training Attention to Regulate Emotion. *Personality and Social Psychology Review* 15(1) 75-102

- Wells, A. (2011) Metacognitive Therapy. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P 83-109.
- Whitebird, R., Kreitzer, M. O'Connor, P. (2009). Mindfulness-based Stress Reduction and Diabetes. *Diabetes Spectrum*, V 22, N4.
- Williams, J., Alatiq, Y., Crane, C., Barnhofer, T., Fennell, M., Duggan, D., et al. (2008) Mindfulness-based Cognitive Therapy (MBCT) in bipolar disorder: Preliminary evaluation of immediate effects on between-episode functioning. *Journal of Affective Disorders*. 107 (1-3), 275-279.
- Williams, M., Teasdale J., Segal, Z., & Kabat-Zinn, J. (2007) *The Mindful Way through depression. Freeing yourself from chronic unhappiness*. New York: Guilford.
- Wilson, K., Bordieri, M., Flynn, M., Lucas., & Slater, R. (2011) Understanding Acceptance and Commitment Therapy in Context: A History of Similarities and Differences With Other Cognitive Behavior Therapies. *Acceptance and Mindfulness in Cognitive behavior Therapy. Understanding and applying the new therapies*. P 233-265.
- Zelazo, P. & Lyons, K. (2012) The Potential Benefits of Mindfulness Training in Early Childhood: A Developmental Social Cognitive Neuroscience Perspective. *Child development perspective*., V6, N2 154-160