

The Mindfulness-Based Stress Reduction Program (MBSR) Reduces Stress-Related Psychological Distress in Healthcare Professionals

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This semi-experimental study examines how Mindfulness facilitates a distress reduction in a group of health professionals. The sample comprises 29 professionals seeking stress reduction who undertook an 8 weeks psico-educative intervention, involving 28 hours of class, based on a program called Mindfulness-based Stress Reduction or MBSR. Results show a 35% reduction of distress, from percentile 75 to 45, combined with a 30% reduction in rumination and a 20% decrease in negative affect. These benefits lasted during the 3 months of the follow up period. The correlation analysis indicates that the decrease in distress is significantly related to the other two variables. These results confirm the effectiveness of MBSR to decrease distress and its applicability in training programs for health professionals.

Keywords: mindfulness, distress, rumination, stress, MBSR.

Este estudio cuasi-experimental examina si el Mindfulness o conciencia plena reduce el malestar psicológico asociado al estrés en profesionales de la salud. La muestra estaba compuesta por 29 profesionales interesados en reducir el estrés, que siguieron una intervención psicoeducativa de 8 semanas, empleando un total de 28 horas lectivas y denominada Reducción de estrés basada en Mindfulness (*Mindfulness-based Stress Reduction o MBSR*). Los resultados muestran una disminución del malestar del 35%, descendiendo del percentil 75 al 45, así como reducciones del 30% en rumiación y del 20% en afectividad negativa. Estas mejoras se mantienen durante el periodo de seguimiento de 3 meses posteriores a la intervención. Las correlaciones encontradas indican que la reducción en malestar psicológico conlleva una disminución de la rumiación y de la afectividad negativa. Estos resultados confirman la utilidad de la técnica *MBSR* para reducir el malestar psicológico en programas de formación para profesionales de la salud.

Palabras clave: mindfulness, conciencia plena, malestar psicológico, rumiación, estrés, MBSR.

According to the *Fourth European Working Conditions Survey* (Agencia Europea, 2007), stress affects at least one in every five workers in Europe and is one of the four most often mentioned occupational health problems. Within the medical profession, stress has motivated more than 600 studies published in the last 40 years (Shapiro, Shapiro & Schwartz, 2000) and it was the occupational health problem most often cited in a national survey of 1,554 doctors (Madrid Médico, 2003). However, official programs in Spain that provide ongoing professional training in health do not usually include stress reduction techniques (Salom, Abril 2005, personal communication), whereas there have been cases of psychosocial interventions in occupational stress in other countries (Ewers, Bradshaw, McGovern & Ewers, 2002). Recently, a new stress-reduction technique, known as MBSR (Mindfulness-based Stress Reduction), has been successfully applied to healthcare professionals (Shapiro, Astin, Bishop & Cordova, 2005).

MBSR is a mind-body type of intervention developed by Jon Kabat-Zinn and his colleagues in 1979 (as cited in Kabat-Zinn, 1982) at the Stress Reduction Clinic at the University of Massachusetts. It is one of the complementary and alternative therapies recognized by the United States National Institute of Health (NCCAM, 2006, page 1). The technique involves developing *Mindfulness*, described in detail by Kabat-Zinn (2003), Martín (2008), and Ludwig and Kabat-Zinn (2008) and reviewed by several different authors (Bishop, 2002; Baer, 2003; Grossman, Niemann, Schmidt & Walach, 2004; Ludwig & Kabat-Zinn, 2008).

Mindfulness has been defined as the sustained intention to focus attention on the reality of the present moment, accept it without judgment, and not get carried away with thoughts or emotional reactions in that moment. This mental state allows one to experience thoughts and feelings in a way that emphasizes their subjectivity and transitory nature (Bishop et al., 2004). Mindfulness is an attitude that requires focused attention on what is happening “here and now,” as opposed to the tendency to allow the mind to wander through memories of the past and fantasies about the future (Kabat-Zinn, 1996).

The attitude of observing and accepting internal experiences is honed during Mindfulness training; it is not, however, a mental control technique, letting the “mind be blank,” or trying not to think. Furthermore, it differs from other emotional and cognitive control techniques characteristic of more traditional approaches such as thought suppression (Wolpe, 1993). On the contrary, whereas more traditional techniques are based on emotional or cognitive control, MBSR teaches the individual to open him or herself up and accept internal experiences, not try to suppress or avoid them. In fact, use of these traditional techniques has been called into question by Clark, Ball and Pape (1991) in the case of thought suppression, and by Cioffi and Holloway (1993) when it comes to pain suppression. Worst of all, it has been found to be associated with obsessive/recurring

thought generation and with increased emotional reactivity (Wegner and Zanakos, 1994).

Mindfulness training’s characteristic openness and acceptance bears a certain resemblance to Hayes, Strosahl and Wilson’s (1999) Acceptance and Commitment Therapy, or ACT, which adds the commitment component. ACT’s objective is to facilitate behavioral changes that satisfy the individual’s deepest values (Hayes, Luoma, Bond, Masuda & Lillis, 2006). It is considered a third generation behavioral therapy (Pérez Álvarez, 2006) along with Linehan’s (1993) Dialectical Behavioral Therapy (or DBT) and an Acceptance-based Cognitive Therapy for treating depression relapses known as Mindfulness-based Cognitive Therapy or MBCT (Kuyken, et al., 2008; Teasdale et al., 2000).

To cultivate Mindfulness, it is necessary to attend to mental events as they occur in real time, or to put it another way, moment by moment, to avoid forming judgments or preferences. It is also important to be present in the process without following any other objective, openly accepting whatever happens without clinging to any one thing (Kabat-Zinn, 2003). Conversely, having an “automatic pilot” attitude would mean focusing consciousness on the area of “thoughts,” which usually correspond to past or future events, thus implying that less attention be paid to the present moment.

That being said, the mind can explore the past through self-awareness or through rumination (Joireman, Parrott & Hammersla, 2002). Rumination means repeatedly and passively concentrating on the sensation of distress, its causes and its consequences (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). Self-awareness, on the other hand, requires a certain emotional distance from events that allows for reflection and learning. While self-awareness is related to positive mood, rumination is associated with elevated emotional distress (Joireman, 2004). In addition, rumination favors a mixture of anxiety and depression (Nolen-Hoeksema, 2000). Given that Mindfulness training teaches the mind to remain in the present moment without judging or allowing oneself to get carried away with negative emotions associated with the past, we believe it could constitute a useful tool to combat rumination.

More than seventy studies published on MBSR in scientific journals have confirmed its effectiveness at alleviating psychological distress related to depression (Teasdale et al., 2000; Teasdale et al., 2002), anxiety (Shapiro, Schwartz & Bonner, 1998), and chronic pain (Kabat-Zinn, 1986) and it has been shown to improve mood in people suffering from cancer (Carlson, Ursuliak, Goodey, Angen, & Specca, 2001) and to be associated with increased general wellbeing (Carmody & Baer, 2008; Reibel, Greeson, Brainard & Rosenzweig, 2001; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008).

There is growing interest in reducing occupational stress due to its severe health repercussions for workers and

the economical implications this occupational risk entails. The MBSR technique is being used in the U.S. to reduce stress in a number of fields, especially in social work and health. In Spain, various papers have been published about applying the MBSR technique to reducing stress-related psychological distress (Martín, García de la Banda & Benito, 2005; Martín & García de la Banda, 2007). Nevertheless, although the results of the MBSR have been positive and well-documented, the mechanism by which this decrease in psychological distress occurs has yet to be identified. In light of this shortcoming, we propose a study to deepen our understanding of the mechanisms involved in MBSR training with the following objectives in mind:

1. To confirm the effectiveness of the MBSR program at reducing the psychological distress associated with stress among healthcare professionals.
2. To verify that this decrease in distress is maintained until follow-up after the intervention is over.
3. To identify the mechanisms by which MBSR reduces stress-related psychological distress. In particular, we will examine the role of Rumination and positive and negative Affective States.

Methods

Participants

To participate in this study, the inclusion criteria were being able to complete the questionnaires and commitment to adhering at the program's attendance and dedication requirements. The exclusion criteria were the following: being in psychological or psychiatric treatment, being pregnant, having planned a surgical procedure, being on medical leave because of depression, or having undertaken legal action because of an illness.

Of the 32 people interested, 3 dropped out before beginning training (2 because of scheduling problems and one because of illness), which left us with a sample of 29. Participants were distributed into two groups upon selection based on the schedule of each class. Finally 17 participants were in the first group and 12 were in the second. Additionally, some people declined to collaborate in the research study but attended the classes anyway, so the classes actually had 22 and 25 participants, respectively.

The total sample, then, was comprised of 29 people with an average age of 41.10 years old ($SD = 9.54$) of whom 83% were women, 76% were healthcare professionals (doctors, nurses, and psychologists), and the other 24% were educational professionals or service industry employees. All participants were actively employed and attended class either because they were experiencing stress, they were interested in applying the MBSR technique to the health sector, or for both reasons.

Instruments

To measure participants' degree of distress, the SCL-90-R inventory (Derogatis, 2002) was applied. It is a 90-item, self-report inventory that assesses symptoms of psychological alteration. It has been validated for a Spanish population and its subscales have high internal consistency, with Cronbach's alpha values between .81 and .90.

Daily stress was evaluated by Kohn and Macdonald's (1992) SRLE (Survey of Recent Life Experiences) scale which includes 51 items; the Spanish language version was employed. Also, the Perceived Stress Scale by Sandín, Chorot and Santed (as cited in Sandín, 1999) was included. The scales had Cronbach's alphas of .91 and .90, respectively.

The Positive and Negative Affect Scale (PANAS) by Watson, Clark and Tellegen (1988) was used to assess affect; it was translated into Spanish by Santed, Sandín, Chorot, Olmedo and García Campallo (2001). The reliability and validity of the questionnaire provided Cronbach's alpha values of .98 for the positive affect scale and .85 for the negative one (Crawford & Henry, 2004).

Rumination was measured by means of the Emotional Control Questionnaire (Roger & Najarian, 1989), translated, adapted and validated by Roger, García de la Banda, Lee and Olason (2001).

Finally, participants evaluated the course when it ended by completing a questionnaire that included a global evaluation of the intervention on a scale of 1 to 10, 1 being the minimum and 10 the maximum, along with various questions designed to determine the person's preferred type of practice, and how often they use it. Last, participants were asked to what extent changes had occurred in their lives that could be due to the intervention.

Intervention

This intervention followed the MBSR program as described by Martín and García de la Banda (2007) and following Kabat-Zinn's model (2003). The training attempts to develop Mindfulness in everyday activities through the practice of exercises to focus one's attention, meditation, and Yoga stretches. The intervention's format was a group occupational training course 28 hours long, which was divided into 8 weekly sessions of 2.5 hours each and one additional 8-hour session. Each session included presenting a particular theme, practice exercises, and a group debate about the strengths and difficulties that these techniques and coping strategies involve when they are applied in everyday life.

Procedure

Participants were recruited among healthcare professionals in various hospitals and primary care centers

in Palma de Mallorca's IB-Health system by hanging up posters and signs. Those interested were invited to an introductory meeting where they filled out forms to indicate their reasons for participating and signed a statement of informed consent. Each participant committed to attending the sessions, answering the evaluation questions, and spending 45 minutes per day on the program to practice its corresponding exercises, at least during the first eight weeks. The classes were open to the general public, and cost 150 euros. People who met the inclusion requirements and wished to collaborate in this study received financial compensation in the form of a coupon after each evaluation; at the end of the study, these amounted to 60% of the total tuition. The program was taught around the work day by an MBSR instructor (first author of this study) who was trained in this technique at the Stress Reduction Clinic at the University of Massachusetts.

The questionnaires were administered pre and post-intervention and 3 months later. The questionnaires were given in a different order at each of the three evaluations so that order would not benefit or disadvantage any questionnaire. Finally, during the post-intervention evaluation, participants also filled out a form to evaluate the course itself.

Results

Average attendance at the sessions was 92% and participants' evaluations of the course were very favorable: a mean of 8.66 out of 10. 79% of participants indicated that the intervention had helped them change their lifestyles in some way. Adherence to the different components of the MBSR was very high given that 93% continued practicing meditation at the end of the intervention and 72% practiced yoga or stretched regularly. Between intervention and follow-up, there was a slight decrease in meditation practice, which fell to 82%, and a slight increase in yoga practice, which rose to 75%.

Since the intervention was carried out in two groups of subjects, prior to intervention, we tested whether there were significant differences in average scores of psychological distress (SCL90-R) between the two groups. To do this, we performed between-groups ANOVA that included the Levene Test for Homogeneity of Variances. Given that the $F(2, 52) = .32$ was not significant ($p = .30$) and neither was the test of homogeneity ($p = .18$), we were able to verify that there were no significant differences between the two groups in average scores of distress prior to intervention. Thus, from that moment on, our analyses collapsed the two groups into one.

Psychological distress (SCL90-R), as measured by the GSI (*General Severity Index*), was significantly reduced with intervention and this change was maintained during the interval between intervention and follow-up. The average

score on the GSI fell from .68 to .45 (44%), falling from the 70th percentile to the 45th (Derogatis, 2002). The value of Cohen's d relative to the effect of treatment was .62, which corresponds to a medium-large effect (Cohen, 1988). At the time of follow-up, a slight increase in distress was noted with a GSI of .51, corresponding to the 50th percentile, as displayed in Table 1.

To determine whether psychological distress was significantly reduced by the intervention and if this change was maintained between intervention and follow-up, we performed a repeated measures, within-groups ANOVA with three levels (pre, post and follow-up) that included Mauchly's sphericity test. The ANOVA proved significant $F(2, 52) = 4.375$, $p = .018$ and eta squared was .14. This means that 14% of variance in distress scores on the SCL-90-R was associated with differences between the three different measurement times. To discover when this decrease in emotional distress occurred, during the interval of intervention or between intervention and follow-up, we performed two univariate, repeated measures post hoc contrasts. Table 1 conveys that the difference in average scores of distress pre and post was significant ($p = .016$). However, the difference in average scores of distress post and follow-up did not reach the established level of significance ($p = .547$). This result demonstrates that the decreases observed after intervention had been maintained at the time of follow-up.

Also note that the mean score of daily stress (SRLE) decreased after intervention, dropping from .70 to .58 according to Table 2; Table 2 shows that was an 18% decrease. The magnitude of change, according to the value of Cohen's d obtained, .39, is considered small. By the time of the three-month follow-up, this decrease had reached 23%.

The average score on the ECQ's Rumination scale also decreased during intervention, as indicated in Table 3. This variable, similar to the previous one, continued to decrease until follow-up, yielding a 29% decrease. This difference corresponds to a medium change, with a Cohen's d of .53.

Scores of positive affect on the PANAS did not exhibit any change. Conversely, negative affect decreased and had maintained that decrease at the time of follow-up, which was a 20% reduction from the initial score, as observed in Table 4. This change was important according to the Cohen's d obtained, a value of .78.

To determine whether the changes in these variables that occurred during intervention were significant, we performed a repeated measures MANOVA in which the dependent variables were stress (SRLE), negative mood (PANAS) and rumination (ECQ). Significant differences were found in the combined means between pre, post and follow-up measurements, Wilks' Lambda = .621, $p = .019$ and eta squared = .21. Thus, we maintain that 21% of variance in the means of these psychological variables

is associated with the three different times. To determine which of these psychological variables is/are responsible for said difference, we went on to test the sphericity using Mauchly's test. From this analysis, we were able to confirm negative PANAS and ECQ, but not SRLE. Thus, the univariate F analysis was applied to the first two, while the Huynh-Feldt was used for the SRLE.

In order to determine which psychological variables generated these differences, we performed a univariate F analysis to see which of the three obtained significant differences. With an alpha value of .01, the ECQ's

(Table 3) and NEG PANAS's (Table 4) means turned out to be significant, with $F(2, 40) = 7.63$ ($p = .002$) and $F(2, 40) = 5.13$ ($p = .010$), respectively. However, the SRLE means (Table 2) were not found to be significant [$F(2, 40) = 3.044$, $p = .073$ using the Huynh-Feldt correction].

Last, we analyzed what variables were associated with decreased psychological distress. To do so, we created a score for the difference between distress experienced pre and post (SCL90R), and did the same for the rest of the study's psychological variables: daily stress (SRLE), negative mood (PANASNEG), and rumination (ECQ). Using these

Table 1
Results of the Psychological Distress Questionnaire (GSI; SCL-90R)

	<i>M</i>	<i>SD</i>	<i>N</i>	<i>df</i>	<i>F</i>	<i>P</i>	<i>D</i>	Changes
Pre	.68	.40	29					
Post	.45	.37	29	1-26	6.707	.016	.62*	100%
Follow-up	.51	.44	27	1-26	.372	.547	.40#	66%

*Cohen's d value results from comparing pre and post.

#Cohen's d value results from comparing the follow-up with the pre value.

Table 2
Results of the Perceived Stress Questionnaire (SRLE)

	<i>M</i>	<i>SD</i>	<i>N</i>	<i>df</i>	<i>F</i>	<i>p</i>	<i>d</i> *	Changes
Pre	.70	.36	29					100%
Post	.58	.24	29	2-40	3.044	.073	.39	82%
Follow-up	.54	.30	27					77%

*Cohen's d value results from comparing the follow-up with the pre value.

Table 3
Results of the Rumination Questionnaire (ECQ)

	<i>M</i>	<i>SD</i>	<i>N</i>	<i>df</i>	<i>F</i>	<i>p</i>	<i>d</i> *	Changes
Pre	4.07	2.27	29					100%
Post	3.61	2.54	29	2-40	5.135	.010	0.53	89%
Follow-up	2.89	2.19	27					71%

*Cohen's d value results from comparing the follow-up with the pre value.

Table 4
Results of the Negative Affect Questionnaire (PANAS)

	<i>M</i>	<i>SD</i>	<i>N</i>	<i>df</i>	<i>F</i>	<i>p</i>	<i>d</i> *	Changes
Pre	23.34	6.97	29					100%
Post	21.52	6.84	29	2-40	7.630	0.002	0.78	92%
Follow-up	18.67	5.01	27					80%

*Cohen's d value results by comparing the follow-up with the pre value.

Table 5

Correlations between the Differences in Pre and Post Measures of Psychological Distress, Perceived Stress, Rumination, and Negative Affect

	<i>SCL90-R</i>		<i>ECQ</i>		<i>SRLE</i>
ECQ	.43(*)	-			
SRLE	.36		.53(**)	-	
PANASNEG	.54(**)		.18		.23

* $p < .05$.

** $p < .01$.

variables, we performed a correlational analysis, the results of which are displayed in Table 5. The correlations between SCL90-R and PANASNEG, and between ECQ and SRLE were shown to be significant.

To summarize, we were able to confirm that psychological distress is significantly reduced after MBSR training to a medium-large degree, which supports the findings of previous studies conducted in Spain (Martín, García de la Banda & Benito, 2005; Martín & García de la Banda, 2007). In addition, we found that this decrease had been maintained at the time of follow-up, as we expected. Level of perceived stress also decreased, though that decrease did not turn out to be of statistical significance, contrary to our expectations. The decrease in rumination and its relationship with reducing distress were especially interesting. Finally, a decrease in the negative component of affect was produced, while the positive component did not change.

Discussion

Our primary objective, to confirm the effectiveness of the MBSR technique at reducing healthcare professionals' levels of psychological distress, was achieved to our satisfaction. The results demonstrate a decrease in psychological distress that was also maintained at the time of follow-up, therefore achieving our second objective. The third and most novel objective was to identify the mechanisms by which MBSR reduces psychological distress. This was also achieved, seeing as how we have confirmed the MBSR's influence over some of the variables studied such as negative affect and rumination.

The first challenge to a program of this kind, voluntary, outside of work, involving homework, is adhering to it. In our case, attendance was 92% and a similar percentage of participants continued meditating after the program ended. This adherence to the technique was greater than the one reported by Carmody and Baer (2008), who had 82% attendance, as well as the 88% cited by Martín and García de la Banda (2007). Some of the factors that may explain this high adherence are: the instructor's experience with this type of intervention, the fact that this course was

professionally accredited, the financial compensation for collaborating, and participants' satisfaction with the content of the program, which is reflected in the average evaluation of the course, an $M = 8.7$ out of 10.

Though attendance is a requisite condition for training of this kind, this alone does not explain our success. We have observed that MBSR training provides a variety of tools to confront daily stress, and in our opinion, part of our participants' success at this training came because they applied these tools to conflicts encountered in their daily lives. According to the biopsychosocial model (Lazarus & Folkman, 1987), because of this learning, important lifestyle changes occur, as 79% of participants indicated, that allow for improvement in coping with stress and a significant reduction in its associated psychological distress.

Of these changes, one of particular interest is the decrease in rumination and the relationship found between rumination, perceived stress, and psychological distress. A medium decrease was observed in this variable and it continued evolving favorably between intervention and follow-up. Ramel, Goldin, Carmona and McQuaid (2004) reported results similar to ours. They found that the practice of Mindfulness reduces rumination, even after controlling for the effect of affective symptoms and dysfunctional thoughts. One possible explanation for these results is that MBSR training, which involves observing sensations, thoughts, and emotions instant by instant, may prevent obsessively ruminating on negative aspects of the past. Also, it seems logical that a decrease in rumination would reduce the perception and negative evaluation of daily stress, which would also produce a significant decrease in stress-related distress.

Finally, we found that negative affect was significantly decreased after treatment. This was probably due to the fact that MBSR training allows one to observe their sensations and negative emotions without producing automatic reactions of rejection. Furthermore, MBSR seems to develop an attitude of openness and "non-judgment" that facilitates acceptance of the negative components of some experiences, without the urgent need to want to change them. Some authors believe that training in MBSR reduces psychological distress because it favors psychological

flexibility (Hayes, Luoma, Bond, Masuda, & Lillis, 2006) and emotional regulation (Gross, 1998). This interpretation seems to be confirmed by the fact that negative affect continues to evolve favorably between intervention and follow-up.

Another possible explanation for the reported decreases in rumination and negative affect would be the fact that the program facilitates participants' coping with certain negative thoughts that are almost always avoided. This makes them extinguish the "negative emotions" that they produce. Keep in mind that the cornerstone of these third generation interventions, such as the MBSR, is accepting negative experiences (Hayes, Wilson, Gifford, Follette & Strosahl, 1996).

To summarize, according to our results, the combination of observation and acceptance of the contents of our thoughts and of physical sensations, promoted by MBSR, is capable of reducing rumination, negative affect and the perception of stress, and as a result psychological distress is significantly reduced. We may infer from these results that as one practices MBSR, they improve their ability to observe and attend to what is happening from day to day, reducing emotional reactivity. This increases feelings of responsibility and personal control, increases psychological flexibility, and improves their capacity for emotional regulation. With these things in mind, MBSR is a technique that provides people with the adequate tools to manage daily stress and reduce the distress it provokes. Although the mechanism we have identified is not entirely conclusive since it fails to measure the development of mindfulness, personal control, cognitive flexibility, emotional reactivity/self-control, or strategy change, we believe it may serve as a guide and that these variables should be included in future research studies.

We are conscious, nevertheless, of the limitations of our study: there was no clinical diagnosis of participants and there was no control group. In addition, the experimental design did not isolate the effect that the intervention had on the group. In light of these limitations, future research will need to design controlled, randomized studies that allow them to evaluate the effectiveness of intervention by comparing the results obtained with those of a control group. With that in mind, our research team is preparing a new study that includes a randomized control group and measures of both mindfulness and the level of cortisol in one's saliva. This new study will allow us to determine if the MBSR group's decrease in psychological distress is greater than that of a control group, whether or not MBSR significantly increases mindfulness, and how MBSR affects physiological activity.

In any case, we assert that MBSR is a useful psycho-educational intervention that decreases the psychological distress associated with stress in healthcare professionals. Also, this decrease will be maintained as long as subjects

continue to integrate the technique into their everyday lives. Given that MBSR is a group intervention program and that it has long term effects, as we have seen, it has very interesting applications within the context of continuing education.

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