

Effectiveness of Mindfulness-Based Stress Reduction in the Reduction of Depression, Childhood Abuse, and Chronic Pain in Women

Atena Fadaei Bashi¹, Biouk Tajeri², Mahdyeh Salehi³

¹ PhD Student, Health Psychology, Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran

² Assistant Professor, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran

³ Assistant Professor, Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran

* **Corresponding author:** Biouk Tajeri, Assistant Professor, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran. Tel: 09123476926; Email: btajeri@yahoo.com

Received 2022 February 06; Accepted 2022 September 05.

Abstract

Background: Chronic pain can cause numerous psychological problems, such as anxiety, depression, and frustration.

Objectives: The present study aimed to determine the effectiveness of mindfulness-based stress reduction (MBSR) in childhood abuse, depression, and chronic pain in women.

Methods: This quasi-experimental study was conducted based on a pre-test-posttest control group design with a follow-up period. The statistical population of this study consisted of all women with chronic pain in Sari in 2019. A number of 20 women with chronic pain who were eligible were selected via convenience sampling method and randomly assigned to two groups of 10. To collect data, the psychological maltreatment Inventory (Coates & Messman-Moore, 2014), multidimensional pain inventory (Kernes et al. 1994), and Self-Rating Depression Scale (Zung, 1967) were used. Data were analyzed in SPSS software (version 24) using descriptive and inferential statistics (analysis of variance and multivariate covariance analysis).

Results: Based on the obtained results, MBSR was effective in the reduction of childhood abuse ($P<0.01$), depression ($P<0.01$), and chronic pain ($P<0.01$).

Conclusion: It can be concluded that MBSR was effective in the reduction of childhood abuse, depression, and chronic pain in women; therefore, this treatment can be used to manage the problems presented to women with chronic pain.

Keywords: Child abuse, Chronic pain, Depression, Female, Mindfulness

1. Background

Chronic pain is a very common condition leading to many psychological problems, such as anxiety, depression, and frustration (1). Some of the most prevalent types of chronic pain include lower back pain, headache, cancer pain, and arthritis. Lower back pain after the chronic headache is the most common reason to visit a doctor (2). Estimates show that 12%-45% of all adults and 60%-80% of the general population are infected once in their lifetime (3). Moreover, 12% of sick leave is due to this problem and 25% of the total compensatory expenses are due to disability in the workplace (4).

It is estimated that 0.5% of the workforce retires six months earlier due to chronic low back pain (5). Although women show the same symptoms of chronic low back pain as men, men are twice as likely as women to undergo surgery (6). The studies pointed to high direct medical expenses, such as surgery, hospitalization, and financial compensation for disability. Moreover, it is difficult to estimate indirect medical costs, such as absenteeism and lack of productivity (7). Studies have demonstrated that psychosocial characteristics can be an important factor in the duration of pain and disability, and psychological therapies are effective in the mitigation of pain (8).

Depression, which is estimated to become the second most common disease in the world by 2020,

is one of the most common features in patients with chronic pain (9). Severe emotional, social, and economic stress for patients with chronic pain, their families, and the community, as well as the increasing annual prevalence of 2.9%-12.9% in the general population, has directed attention to the treatment of this disorder in people with chronic pain more than before (10).

On the other hand, some studies have pointed out that depression in patients with chronic pain is associated with childhood abuse symptoms; therefore, it is obvious that a person with chronic pain not only struggles with chronic disease stress but is also influenced by other psychological factors, such as the proposed changes. Child abuse is any act or neglect that results in significant physical or psychological harm to the child (11). Children of every gender, age, race are at risk of abuse (12). Abuse includes four types of physical, sexual, emotional, and neglectful abuse of the child (13).

Psychological abuse is the most common type of childhood abuse (14) to the extent that some researchers believe that among the types of abuse, psychological abuse exerts more negative and long-term effects (15). Existing knowledge about the long-term impact of psychological abuse in childhood is far less than that of sexual or physical abuse (16). Psychological abuse is very difficult to define and includes excessive self-abuse, ridicule, derogatory expressions, condemnation, and threats

against the child to the point that his/her mental health is endangered (17).

Some researchers believe that psychological abuse is most associated with depression in adulthood (18). For example, some researchers have reviewed the background of studies on child abuse and concluded that child psychological abuse is more closely linked to depression, as compared to physical and sexual abuse (19). In other words, of various types of child abuse, physical abuse has the least association with depressive symptoms in adulthood, and sexual abuse is a risk factor for psychological pathology in general (20).

Furthermore, depression in women with chronic pain is a strong predictor that causes harm, such as decreased optimal perception, life expectancy, and hope for success in all areas (21). In explaining the role of various factors in the formation of psychological well-being, as well as the reduction of stress and depression, the role of individual and social factors is emphasized more than other factors. The research findings in this area have demonstrated obvious contradictions so that it is not possible to clearly explain the role of individual and social factors affecting the rate of depression, childhood abuse symptoms, and stress (22).

Mindfulness is one of the variables associated with psychological well-being in patients suffering from pain (23). It is the full presence in and complete awareness of the current moment without any judgmental thoughts about what is going on. In other words, it is experiencing pure reality without any explanation. The basis of mindfulness is derived from Buddhist meditation practices through which one can have a higher capacity to pay attention consistently and intelligently and gain awareness that goes beyond thought. The beauty of mindfulness meditation is that it can be generalized to anything that is performed at the moment (24). Meditation and mindfulness exercises increase the ability of self-awareness and self-acceptance in patients.

Mindfulness is neither a method nor a technique, but there are several methods and techniques for its practice. Therefore, it can be an approach toward presence and awareness based on how one feels (25). Mindfulness experience is a wide field encompassing feelings, perceptions, impulses, emotions, thoughts, speech, actions, and communication, and therefore can help people with emotional problems. According to some researchers, the learned skills of attention control in mindfulness meditation can be useful in preventing the recurrence of depression, anxiety, and aggression (26). Hasani and Emamverdi (27) in their study entitled "Effectiveness of mindfulness-based group cognitive therapy in expressing women with chest pain" concluded that cognitive therapy reduces dysfunctional beliefs of patients with pain

along with medical treatments used in oncology.

Any therapeutic intervention that can positively change people's lifestyles is valuable due to the role of pain in developing a variety of psychological disorders, such as depression and childhood misbehavior. Interventions for psychological training have been performed for many chronic diseases, such as AIDS, cancer, rheumatic articulation and other chronic pain disorders, insomnia, intestinal disorders, and chronic fatigue syndrome. Studies have pointed to the positive results of the psychological approach that reduce symptoms of the disease and increase self-efficacy, physical activities, and quality of life. In light of the aforementioned issues, the present study aimed to investigate the effect of cognitive therapy and MBSR on women who experience chronic pain, along with childhood misbehavior and depression symptoms. The results of this study can be of great help in improving the health status of society, as well as planning for the achievement of mental and physical health.

2. Objectives

The purpose of this study was to determine how effectively MBSR can reduce childhood abuse, depression, and chronic pain in women.

3. Methods

This quasi-experimental study was conducted based on pre-test design, post-test control group design with a follow-up period. The statistical population of this study included all 175 women with chronic pain in Sari, according to statistics obtained from Sari University of Medical Sciences. Among the eligible volunteers, 20 participants were selected via the convenience sampling method based on inclusion and exclusion criteria; thereafter, they were assigned to two groups of experimental and control (n=10 in each group). The sample size was determined according to previous research, with an effect size of 0.40, 95% confidence interval, test power of 0.80, and the attrition rate of 10% for each group (6). The experimental group underwent MBSR intervention for eight 90-min sessions once a week, while the control group did not receive any intervention. After two months, the follow-up period was performed. To follow ethical considerations, participants were informed about the research by written explanation and participated in the study out of willingness. People were reassured that all information was confidential and would be solely used for research purposes. To protect privacy, the names of the participants were not recorded; nonetheless, to compare the pre-test, post-test, and follow-up of each participant, each of them was assigned a. This article has an ethics code number IR.HUMS.REC. 1399.097.

Zung Self-Rating Depression Scale

The Zung Depression Inventory was developed in 1967 to assess the extent of depression based on measurement criteria in adults (28). This 20-item questionnaire is rated on a four-point Likert scale (strongly agree=4, agree=3, disagree=2, and strongly disagree=1), yielding minimum and maximum scores of 20 and 80. The majority of respondents score from 50-69, and few people get a score above 70. To calculate the total score, the obtained scores of the answers are added, and the maximum score of depression is 80. Most people with depression have a score between 50 and 59. Its reliability was also calculated using Cronbach's alpha test. In a study conducted by Babakhanian and Ghazanfarpour in Iran, the Cronbach's alpha coefficient of this questionnaire was above 0.70, indicating its acceptable reliability (29). Cronbach's alpha coefficient of this questionnaire was reported as 0.78 in the present study.

Psychological maltreatment Inventory

This scale is a 24-item retrospective self-report tool of events related to past stressful abuse (30). This scale initially contained 57 items; nonetheless, it was reduced to five main factors. Five subscales will be assessed, including emotional non-response, rejection/intimidation, immorality/dishonesty, expectation/inflexibility, and isolation. The items are rated on a 5-point Likert scale ranging from strongly disagree=1 to strongly agree=5. The Cronbach's alpha coefficient of this scale among students was between 0.90 and 0.96. In the study by Coates et al., Cronbach's alpha coefficients were obtained at 0.93, 0.83, 0.58, and 0.70 for the subscales of emotional non-response scale, rejection/intimidation, immoral/dishonesty, and high-expectation/inflexibility, respectively. The results of a study by Nazari and Farhadi indicated that Cronbach's alpha of this questionnaire in Iran was 0.89 (31). Cronbach's alpha coefficient of this questionnaire was calculated at 0.81 in the present study.

Multidimensional Pain Inventory

The Multidimensional Chronic Pain Questionnaire was developed by Kernes et al. (32). The items are rated on a 7-point Likert scale ranging from 0-6, and in all subscales of this questionnaire, the minimum and maximum scores are 0 and 6. This subscale consists of 3 questions that assess a person's pain. The minimum and maximum scores in this subscale are 0 and 6. To score the severity of pain, the subjects' scores are added together in items 1, 7, 12, and the result is then divided by 3. Moreover, to measure the rate of daily dysfunction, the daily dysfunction subscale of this questionnaire was used. For this purpose, the subject's scores in items 19, 17, 13, 14, 9, 3, 40, 8, 2 are added together and the result is then divided by 9. The minimum and maximum scores in this subscale are also 0 and 6. Kerns et al. used the factor analysis method and calculated the correlation between the extracted factors and the results of valid questionnaires to validate the multidimensional pain questionnaire. They also reported the desirable validity of the multifaceted pain questionnaire factors (homogeneity coefficients of 0.70-0.90 and retest coefficients between 0.60 and 0.92 (33). In the context of Iran, the questionnaire has been validated, and its reliability has been verified. Based on the findings of a study by Asghari et al., Cronbach's alpha coefficients of the subscales of this questionnaire ranged from 0.70-0.92, and the mean correlation coefficients between the items of each subscale ranged from 0.25-0.54 (34). Cronbach's alpha coefficient of this questionnaire was obtained at 0.74 in the present study.

Data were analyzed in SPSS software (version 22) using descriptive statistics, such as mean, standard deviation, and inferential statistics of repeated measures analysis. Shapiro-Wilks test was used to evaluate the assumption of normality of repeated measures test, Levene test was utilized to find if variances were homogeneous, and the significance level of the tests was considered 0.05.

Table 1. Sessions of mindfulness cognitive therapy

Sessions	Content
First	Participants exercised, and their bodies were checked accordingly. They had sessions to meditate, practice mindfulness, and breathe in three-minute cycles to practice mindfulness formally. In this session, participants had to select a daily activity and be fully aware of their sensory experiences in the activity during the coming week. During the sessions, they had a chance to share the experiences of the week. In addition, they practiced bodily senses and realized that when they are aware of their body parts, which is easy to do, they can more powerfully control what goes on in their mind. Therefore, they tried to learn to focus on their body parts completely by imagining how air passes in inhaled and exhaled and then runs through their body. This way, focusing on the air movement was a means to control their attention.
Second	Participants were asked to write their pleasant daily experiences in a timetable while being fully aware of the details of each experience. For instance, they had to record their bodily feelings, ongoing thoughts, mentalities, and emotional state. While writing, they also had to mention their thoughts at the moment of writing. Moreover, they were asked to pay attention to their breathing emotions to experience full presence at that moment. By focusing on each experience in detail and from different aspects, they were separated from deep mental activities.
Third	The third session had the same procedures for analyzing unpleasant daily experiences, such as a lengthy traffic light stay, mopping the floor, or contacting customer service. There were also meditation sessions to practice focusing, mindful attention, and the organization of thoughts. The ability to supervise mental activities can facilitate consciousness and mindfulness and broaden the range of experiences.
Fourth	This session aimed to draw attention to emotion as a mental state resulting from an event as well as the interpretation.

Table1 Continue

Participants were asked to relax with their eyes closed and imagine an undesirable situation. During this exercise, each group member would respond to the situation, which indicates their emotion about that situation is formed by their thoughts.

Fifth In this session, participants learned they can avoid unpleasant conditioned reactions, such as disgust, stress, emotional contractions, and destructive thoughts regarding unpleasant occurrences by manipulating their emotions. To this end, they were encouraged to think positively and welcome momentary happenings. They were instructed to recall a haunting unpleasant experience and review their thoughts about it with bodily sensations. This strategy is a movement towards reinforcing relationships and accepting dark and ignored experiences which still influence us. Therefore, problems are still there, but individuals learn to embrace them as they are rather than change them. This process helps group members realize how frequently they think of these problems, and if they modify their views, these issues become positive. This session aimed to promote embracing reality as it is, regardless of any judgmental thoughts.

Sixth In this session, they had to understand the two-sided relationship between thoughts and emotions, in which one can affect the other. They learned mindfulness can help them remove habitual reactions by having full attention to the issue and improving one's attitude about it. They were reminded that their interpretation of an event is highly influenced by their past experiences and mental conditions. Therefore, they realized they should interpret events more cautiously. It can be assumed that such events were not necessarily representations of reality. Mindfulness can offer new ways to stay in the present, such as using the sensory experiences, conscious breathing, and sitting meditation, that were performed by the group members at this session.

Seventh This session aimed to advocate that thoughts are not facts, and what we think about is merely a thought. Therefore, we have the choice not to act on them, deal with them, or consider them subjective altogether. In this session, the ways to get out of the negative mood and thoughts were taught to the members of the group, and they could use them as lenses and examine and observe their experiences more closely. This process of recognizing the existing patterns of thought can help us ruminate by sitting meditation and seeking other solutions. However, by reaching a broader perspective on our thinking process, we will be able to work on them cognitively with an attitude of inquiry.

Eighth The participants learned that to attend to and focus on created experiences, they should feel them, experience them, and observe them consistently and accurately. Mindfulness exercises aim to remove conditioned and repetitive behaviors. First, we should define a goal to guide our experiences and give us the mindfulness to embrace reality without judgments or intentions of adjustment. This method of describing experiences made group members aware they should abandon their futile thinking about their experiences. Mindfulness guides us to purposeful and motivated attention to achieve the desired results.

4. Results

The mean age scores of participants were obtained at 39.5±7.4 and 37.8±6.2 years in the experimental and control groups (the age range of 20-55 years). In Table 2, descriptive indicators are mentioned in three stages: pre-test, post-test, and follow-up.

The results of the Kolmogorov-Smirnov test analysis demonstrated that the Z values obtained in the experimental and control groups were greater than the critical value (α=0.05). Therefore, for all variables, the null hypothesis of a normal distribution is confirmed and hypothesis one based on non-normal distribution is rejected. Based on the aforementioned issues, it can be stated that the distribution of variables was normal; consequently,

statistical parametric methods were used to analyze the data.

As displayed in Table 3, there is a significant difference between the two groups of mindfulness intervention based on stress reduction and control in the pre-test, post-test, and follow-up in childhood abuse syndrome in women with chronic pain. The results of the table also show a significant interaction between the pre-test-post-test and the follow-up group. According to the table of post-test and follow-up, childhood abuse syndrome is less in the experimental group than the control group. Therefore, stress-based mindfulness has been effective on childhood abuse syndrome and its dimensions in women with chronic pain. There is a significant difference between the two groups of

Table 2. Mean and standard deviation of subjects' scores in the variables of depression, chronic pain, and symptoms in the experimental and control groups

Variables	Intervention						Control					
	Pre-test		Post-test		Follow-up		Pre-test		Post-test		Follow-up	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Depression	3.87	0.43	3.77	0.41	3.68	0.37	2.74	0.31	2.47	0.41	2.43	0.39
Chronic pain	3.24	0.36	3.21	0.32	3.18	0.30	3.17	0.51	3.01	0.31	3.04	0.32
Childhood Abuse	3.51	0.36	2.54	0.25	2.50	0.23	3.63	0.39	3.69	0.42	3.67	0.41

Table 3. Repeated measures analysis of variance to compare pre-test, post-test, and follow-up of childhood abuse syndrome

Variable	Source	SS	df	MS	F	Eta
Childhood Abuse	Time	591.500	1	591.500	73.08	0.73
	Group	76.190	1	76.190	4.43	0.14
	Time*Group	52.071	1	52.071	6.43	0.19
Depression	Time	355.01	1	355.01	48.06	0.64
	Group	377.19	1	377.19	28.87	0.52
	Time*Group	75.46	1	75.46	10.21	0.28
Chronic pain	Time	3600.01	1	3600.01	83.53	0.76
	Group	1885.76	1	1885.76	19.91	0.43
	Time*Group	598.01	1	598.01	13.87	0.34

Table 4. Bonferroni post hoc test for comparison of pre-test, post-test, and follow-up of childhood abuse syndrome in experimental (stress-based mindfulness) and control groups

Variable	Group	Stage	Mean difference	
			Post-test	Follow-up
Childhood Abuse Syndrome	Intervention	Pre-test	9.85*	8.42*
		Post-test	-	-1.42
	Control	Pre-test	8.00*	4.57*
		Post-test	-	-3.42*
Depression	Intervention	Pre-test	9.28*	7.35*
		Post-test	-	-1.92
	Control	Pre-test	4.42*	2.71
		Post-test	-	-1.71
Chronic pain	Intervention	Pre-test	26.12*	27.57*
		Post-test	-	27.85*
	Control	Pre-test	13.28*	16.51*
		Post-test	-	18.78*

*P<0.01

MBSR and control in the pre-test, post-test, and follow-up of depression in women with chronic pain. This table also depicts that the interaction between the pretest-posttest follow-up group is significant. There is a significant difference between the two groups of MBSR and control in the pre-test, post-test, and follow-up of pain relief in women with chronic pain. The results of the table also show that the interaction between the pre-test-post-test follow-up group is significant.

As illustrated in Table 4, in the experimental group (stress-based mindfulness), post-test scores and follow-up of childhood misbehavior symptoms decreased, compared to pre-test scores. In the control group, post-test and follow-up scores were reduced, compared to those in the pre-test. In the experimental group, post-test and follow-up scores of depression decreased, compared to those in the pre-test. In the control group, post-test and follow-up scores were reduced, compared to those obtained in the pre-test. In the experimental group (stress-based mindfulness), post-test and follow-up scores of chronic pain increased, compared to those reported in the pre-test. In the control group, post-test and follow-up scores increased, compared to those in the pre-test.

5. Discussion

The present study aimed to determine the effectiveness of MBSR in childhood abuse, depression, and chronic pain improvement in women. The results pointed out that MBSR was effective in childhood abuse symptoms, depression, and chronic pain in women. This result is consistent with the findings reported by Norouzi & Hashemi (26), Hasani & Emamverdi (27), Andersen et.al (35), Dutton et.al (36), and Marchand (37).

In explaining this result, it can be stated that the problems caused by childhood abuse, apart from a borderline personality disorder in adulthood, lead to cognitive and dissociative disorders, low self-esteem, depression, antisocial personality disorder,

sudden onset of fear, post-traumatic stress, suicidal thoughts, and fear which manifest themselves in adulthood (24). Regarding the predisposing factors of mental disorders, several studies have reported traumatic experiences at an early age. Traumatic childhood and adolescence experiences of borderline patients often occur in a troubled family context in which parents have mental health problems and are unable to provide a safe and predictable environment for trauma prevention or are themselves the cause of the trauma. They report that these people grow up in highly chaotic and troubled families with a caregiver suffering from multiple problems. In addition, they reported that borderline individuals experience physical and sexual abuse in a context of highly inappropriate parenting behaviors, broken attachments, neglect, and rejection (19).

Mindfulness is a skill that allows us to receive events in the present less than they are distressing. The mind is conscious to wake up to recognize that everything is happening in the present. When we are aware of the present, our attention is no longer tied to the past or future. Most mental health problems are often accompanied by events in the past that often make them feel sorry and guilty, and those who are anxious worrying about future problems experience fear and anxiety. We must be wandering in the present and focus most of our mind's activities on daily life, and mindfulness place a focus on the present (12).

Conscious breathing practice is used as the center of attention and a reference point used by patients to return to the present when their minds are disturbed by negative thoughts and emotions. Returning to one's body and the present is experienced when the patient thinks and feels attracted to them by reflecting on their past or future and being in constant patterns (16). Mindfulness exercises strengthen the mind's ability to return to the present moment even in challenging situations. Conscious attention to the present taught patients a new way to understand and respond to

all the inner feelings, and the patient was able to recognize their feelings, thoughts, and experiences. Regarding thoughts only as a thought, not a truth, cultivates the mind which reduces defective patterns and rumination, thereby reducing depression (17).

This study only investigated women with chronic pain; consequently, great caution should be exercised in the generalization of the results. In this study, a questionnaire was used to collect data; therefore, since the questionnaires have a self-assessment aspect and people tend to show themselves more completely than they are, there may be bias in the answers. Moreover, due to the time limit of control, other variables of the research have not been possible which may have affected the results of the research. It is suggested that MBSR be used for families of patients with incurable diseases. According to the findings of this study, it is suggested that be separately taught to patients in a specific framework. Mindfulness can also have a marked effect on the reduction of psychological symptoms; accordingly, it is suggested to teach mindfulness therapy training as a useful treatment method to reduce clinical problems in patients with chronic pain. Furthermore, it is suggested that mindfulness training be taught to counselors and therapists in order to take an effective step in improving the health of patients with chronic pain and use these treatments for a long time.

Study Limitations

Our study is not without limitations. the number of participants was small(n=10 in each group), which makes the statistics' unstable. Therefore, more studies are needed to generalize the results.

Strength of the study

Excellent controls and multiple settings in selecting the research sample and implementing the research process. And the precise conduct of the research (quasi-experimental study) is one of the strengths of the current research.

6. Conclusion

As evidenced by the results of this study, it can be concluded that MBSR was effective in the reduction of childhood abuse symptoms, depression, and chronic pain in women; therefore, this treatment can be used to manage the problems presented to women with chronic pain.

Acknowledgments

We are extremely grateful to all the people who helped us in this research.

Conflicts of interest

The authors declare no conflict of interest do not have.

References

- Heshmati, F., ElmyManesh, N., Heshmati, R. Structural relationship of behavioral activation and inhibition system, dispositional mindfulness and chronic pain. *Quarterly Journal of Health Psychology*. 2018; 6(24): 120-137.
- Ackerman MD, Stevens M J. Acute and chronic Pain: Pain dimensions and psychological status. *J Clin Psycho* 2018;45(2): 223-8. [https://doi.org/10.1002/1097-4679\(198903\)45:2<223::AID-JCLP2270450208>3.0.CO;2-Y](https://doi.org/10.1002/1097-4679(198903)45:2<223::AID-JCLP2270450208>3.0.CO;2-Y)
- Anchorena MN, Ghiglione F, Nader M. Psychometric properties of the Five Facet Mindfulness Questionnaire in an Argentine sample. *Archives of Assessment Psychology*. 2017;7(1):29-41.
- Twohig MP, Levin ME. Acceptance and commitment therapy as a treatment for anxiety and depression: a review. *Psychiatric clinics*. 2017;40(4):751-70. <https://doi.org/10.1016/j.psc.2017.08.009>
- Bränström R, Kvillemo P, Brandberg Y, Moskowitz JT. Self-report mindfulness as a mediator of psychological well-being in a stress reduction intervention for cancer patients—A randomized study. *Annals of behavioral medicine*. 2010;39(2):151-61. <https://doi.org/10.1007/s12160-010-9168-6>
- Bränström R, Duncan LG, Moskowitz JT. The association between dispositional mindfulness, psychological well-being, and perceived health in a Swedish population-based sample. *British journal of health psychology*. 2011;16(2):300-16. <https://doi.org/10.1348/135910710X501683>
- Enkema MC, McClain L, Bird ER, Halvorson MA, Larimer ME. Associations Between Mindfulness and Mental Health Outcomes: a Systematic Review of Ecological Momentary Assessment Research. *Mindfulness*. 2020:1-5. <https://doi.org/10.1007/s12671-020-01442-2>
- Tegner H, Frederiksen P, Esbensen BA, Juhl C. Neurophysiological pain education for patients with chronic low back pain. *The Clinical journal of pain*. 2018;34(8):778-86. <https://doi.org/10.1097/AJP.0000000000000594>
- Cordeiro P, Paixão P, Lens W, Lacante M, Sheldon K. Factor structure and dimensionality of the balanced measure of psychological needs among Portuguese high school students. Relations to well-being and ill-being. *Learning and Individual Differences*. 2016;47:51-60. <https://doi.org/10.1016/j.lindif.2015.12.010>
- Eccleston C, Morley SJ, Williams AD. Psychological approaches to chronic pain management: evidence and challenges. *British journal of anaesthesia*. 2013;111(1):59-63. <https://doi.org/10.1093/bja/aet207>
- Liang YD, Li Y, Zhao J, Wang XY, Zhu HZ, Chen XH. Study of acupuncture for low back pain in recent 20 years: a bibliometric analysis via CiteSpace. *Journal of pain research*. 2017;10:951. <https://doi.org/10.2147/JPR.S132808>
- Gatchel RJ, Polatin PB, Mayer TG. The dominant role of psychosocial risk factors in the development of chronic low back pain disability. *Spine*. 1995;20(24):2702-9. <https://doi.org/10.1097/00007632-199512150-00011>
- González-Cutre D, Sicilia Á, Sierra AC, Ferriz R, Hagger MS. Understanding the need for novelty from the perspective of self-determination theory. *Personality and individual differences*. 2016;102:159-69. <https://doi.org/10.1016/j.paid.2016.06.036>
- Johnston JM, Landsittel DP, Nelson NA, Gardner LI, Wassell JT. Stressful psychosocial work environment increases risk for back pain among retail material handlers. *American journal of industrial medicine*. 2003;43(2):179-87. <https://doi.org/10.1002/ajim.10165>
- Kamimura A, Nourian MM, Assasnik N, Franchek-Roa K. Depression and intimate partner violence among college

- students in Iran. *Asian journal of psychiatry*. 2016;23:51-5. <https://doi.org/10.1016/j.ajp.2016.07.014>
16. Karademas EC. Positive and negative aspects of well-being: Common and specific predictors. *Personality and individual differences*. 2007;43(2):277-87. <https://doi.org/10.1016/j.paid.2006.11.031>
 17. Kimbrel NA, Meyer EC, DeBeer BB, Gulliver SB, Morissette SB. A 12-Month prospective study of the effects of PTSD-depression comorbidity on suicidal behavior in Iraq/Afghanistan-era veterans. *Psychiatry research*. 2016;243:97-9. <https://doi.org/10.1016/j.psychres.2016.06.011>
 18. Liang L, Zhou D, Yuan C, Shao A, Bian Y. Gender differences in the relationship between internet addiction and depression: A cross-lagged study in Chinese adolescents. *Computers in Human Behavior*. 2016;63:463-70. <https://doi.org/10.1016/j.chb.2016.04.043>
 19. Linton SJ. A review of psychological risk factors in back and neck pain. *Spine*. 2000;25(9):1148-56. <https://doi.org/10.1097/00007632-200005010-00017>
 20. Mahati K, Bhagya V, Christofer T, Sneha A, Rao BS. Enriched environment ameliorates depression-induced cognitive deficits and restores abnormal hippocampal synaptic plasticity. *Neurobiology of learning and memory*. 2016;134:379-91. <https://doi.org/10.1016/j.nlm.2016.08.017>
 21. Olbrich D. Psychological and psychosocial factors in chronic backache. Findings and social medicine consequences. *Versicherungsmedizin*. 2003;55(2):70-5.
 22. Pulliam CB, Gatchel RJ, Gardea MA. Psychosocial differences in high risk versus low risk acute low-back pain patients. *Journal of Occupational Rehabilitation*. 2001;11(1):43-52. <https://doi.org/10.1023/A:1016604208480>
 23. Scalzitti DA. Screening for psychological factors in patients with low back problems: Waddell's nonorganic signs. *Physical therapy*. 1997;77(3):306-12. <https://doi.org/10.1093/ptj/77.3.306>
 24. Teasell RW, White K. Clinical approaches to low back pain. Part 1. Epidemiology, diagnosis, and prevention. *Canadian Family Physician*. 1994;40:481.
 25. Top ED, Karaçam Z. Effectiveness of structured education in reduction of postpartum depression scores: a quasi-experimental study. *Archives of psychiatric nursing*. 2016;30(3):356-62. <https://doi.org/10.1016/j.apnu.2015.12.009>
 26. Norouzi H, Hashemi E. The Efficacy of Mindfulness-based Cognitive Therapy (MBCT) on Emotion Regulation among Patients with Breast Cancer. *ijbd*. 2017; 10(2) :38-48.
 27. Hasani J, Emamverdi F. The effectiveness of mindfulness based group cognitive therapy on assertiveness of women with breast cancer. *EBNESINA*. 2017; 19(2):21-27.
 28. Jokelainen J, Timonen M, Keinänen-Kiukaanniemi S, Härkönen P, Jurvelin H, Suija K. Validation of the Zung self-rating depression scale (SDS) in older adults. *Scandinavian journal of primary health care*. 2019;37(3):353-7. <https://doi.org/10.1080/02813432.2019.1639923>
 29. Babakhanian M, Ghazanfarpour M. Factor structure and psychometric properties of the Zung Self-Rating Depression Scale in a population of women with a sick child. *International Journal of Pediatrics*. 2020;2(3):37-49.
 30. Coates AA, Messman-Moore TL. A structural model of mechanisms predicting depressive symptoms in women following childhood psychological maltreatment. *Child Abuse Negl*. 2014;38(1):103-113. <https://doi.org/10.1016/j.chiabu.2013.10.005>
 31. Nazari H, Farhadi A. Predicting Depression Symptoms Following Childhood Psychological Maltreatment: The Mediating Role of Early Maladaptive Schemas and Difficulties in Emotion Regulation. *J Mazandaran Univ Med Sci*. 2016; 26(136):85-98.
 32. Kerns RD, Rosenberg R, Jacob MC. Anger expression and chronic pain. *Journal of behavioral medicine*. 1994;17(1):57-67. <https://doi.org/10.1007/BF01856882>
 33. Mahigir F, Khanekhesi A, Karimi A. Psychological treatment for pain among cancer patients by rational-emotive behavior therapy-efficacy in both India and Iran. *Asian Pacific Journal of Cancer Prevention*. 2012;13(9):4561-5. <https://doi.org/10.7314/APJCP.2012.13.9.4561>
 34. Asghari A, Nicholas MK. An investigation of pain self-efficacy beliefs in Iranian chronic pain patients: a preliminary validation of a translated English-language scale. *Pain medicine*. 2009;10(4):619-32. <https://doi.org/10.1111/j.1526-4637.2009.00623.x>
 35. Andersen E, Geiger P, Schiller C, Bluth K, Watkins L, Zhang Y, Xia K, Tauseef H, Leserman J, Girdler S, Gaylord S. Effects of mindfulness-based stress reduction on experimental pain sensitivity and cortisol responses in women with early life abuse: A randomized controlled trial. *Psychosomatic Medicine*. 2021;83(6):515-27. <https://doi.org/10.1097/PSY.0000000000000889>
 36. Dutton MA, Bermudez D, Matas A, Majid H, Myers NL. Mindfulness-based stress reduction for low-income, predominantly African American women with PTSD and a history of intimate partner violence. *Cognitive and behavioral practice*. 2013;20(1):23-32. <https://doi.org/10.1016/j.cbpra.2011.08.003>
 37. Marchand WR. Mindfulness-based stress reduction, mindfulness-based cognitive therapy, and Zen meditation for depression, anxiety, pain, and psychological distress. *Journal of Psychiatric Practice*. 2012;18(4):233-52. <https://doi.org/10.1097/01.pra.0000416014.53215.86>