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Effectiveness of Cognitive-Behavioral Hypnotherapy on the Reduction of Perceived Pain and Distress in Patients with Chronic Low Back Pain

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ABSTRACT

Low back pain is one of the commonest and most costly musculoskeletal problems in today's society. As the pain is not merely a sensory experience and is considered an emotional-cognitive experience, the present study was conducted to examine the effectiveness of cognitive-behavioral hypnotherapy (CBHT) on the severity of pain and distress in patients with chronic low back pain (CLBP). The method was a single subject design A-B. The population was adult women with CLBP admitted to Pain Clinic of Labbafinejad Hospital, Tehran, in 2017. The sampling was convenient (purposive) sampling. Four subjects underwent 8 sessions of individual CBHT and baseline, intervention and follow-up evaluations were performed using numerical-grading scale measurement tools to measure pain and distress severity. Visual analysis of the data chart by comparing the changes in the dependent variable levels based on the median and mean, stability and the percentage of overlapping and non-overlapping data (PND) at the baseline stage, intervention and follow up showed that the intervention was effective in reducing the severity of pain and especially distress in patients with CLBP. CBHT is effective in relieving pain and the distress associated with pain and can be used as a non-invasive therapy without side effects in managing and controlling the different aspects of pain in patients with CLBP.

Key words: CBHT, Hypnotherapy, Low Back Pain, Chronic Pain, Distress

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INTRODUCTION

One of the major diseases of the backbone is CLBP. The annual incidence of this disorder is 18-20% in adults and its prevalence is about 50% [1]. The direct and indirect costs of this complication can be the same as the cost paid for cardiovascular diseases, depression and diabetes [2]. In America, back pain is the second cause of visiting a doctor with $ 50 million spent on its treatment [3].

Daily absence, direct and indirect costs of therapeutic interventions and reductions in productivity are examples of estimating costs spent concerning this disease [2]. According to the studies of low-back pain disability, psychological variables are usually more effective than biomedical or biochemical factors, changing the state of pain from acute to chronic [4]. The pain becoming chronic affects the suffering person not only by the pressure created by the pain, but also by many other continuous pressure factors that affect the various aspects of his life. Reduction in performance, deficiencies in occupational, professional and interpersonal activities, deprivation from desired activities, and maybe the loss of interest in recreational activities abundantly seen in these patients can lead to the loss of morale, withdrawal, constant thinking with pain, mood problems and sleep disorders [5]. On the other hand, the failure of drug-based one-dimensional therapies in the treatment of these

patients, along with the lack of adequate pathological and pathophysiologic pathology results reinforce patient cognition and beliefs about the lack of control of pain and incurable pain, intensifying the feeling of helplessness due to psychological stress, interpersonal, career and mood problems.

Studies of the past 30 years have shown the psychological aspects of pain experience, so that the International Association for the Study of Pain (IASP) defines pain as a "sensory and emotional experience." Thus, it not only emphasizes the subjectivity of pain as one of its intrinsic properties, but also stresses emotional factors as much as sensory factors. Today, the bio-psycho-social perspective is accepted in the health systems - at least theoretically - especially in the field of chronic pain. As the psychological stances of the individual are involved in creating or determining the pain, the bio-psycho-social therapies are also involved in its treatment. Today, psychological methods are used both individually and in combination with medical methods in the treatment of chronic pain, and research indicates the efficacy of psychological treatments in managing chronic pain [6].

CLBP is the combination of hypnotherapy with the techniques and concepts of cognitive and behavioral therapies [7]. CBHT is based on the assumption that most psychological disturbances are the result of a negative form of self-hypnosis, so that negative thoughts are accepted critically and even without informed consent [8]. Cognitive-behavioral hypnosis includes several basic techniques that are well suited to the therapeutic goals of patients with CLBP. These techniques include relaxation, guided imagery (both related to the intensity of pain), cognitive reconstruction of ineffective self-talk (related to the emotional dimension of pain), sequential approximations (related to the pain avoidance), and self-hypnosis education (related to self-efficiency and sustainability of the treatment) [7].

Nowadays, hypnosis is widely used as an effective therapeutic tool in various branches of medicine, dentistry and psychology. These uses are not limited to the psychological effects of hypnosis, but their many physiological effects, which have a robust research support, are important reasons for using this method in psychosomatic disorders [9].

Given the prevalence of CLBP and its adverse effects on the various personal, emotional and social aspects of life of the affected person, the family and important individuals of the person's life, and since pain is not just a sensory experience - is an emotional-cognitive experience as well - this study was conducted to evaluate the effectiveness of CBHT on the severity of pain and distress in patients with CLBP.

Research hypotheses

- CLBP is effective in reducing perceived pain intensity in patients with CLBP.
- CLBP is effective in reducing perceived distress in patients with CLBP.

MATERIALS AND METHODS

The study was conducted in form of an experimental case study of A-B type. Purposive sampling method was used to select the sample, and the sample size was four subjects.
The population of the study was adult women with CLBP admitted to the pain clinic of Labbafinejad Hospital, Tehran in 2017. The sample consisted of patients willing to participate in the study and comply with inclusion and exclusion criteria.

Inclusion criteria

- Receiving diagnosis of CLBP
- Being an adult woman (18 to 60 years)
- Their hypnotizability with Hypnotic Induction Profile (HIP) test should be medium and higher (10 or higher).

Exclusion criteria

- Prohibition of the use of hypnosis (epilepsy, paranoid personality disorder, borderline personality disorder (BPD), history of psychosis, major depression)

Implementation

In the first stage, after coordination with the specialist in the Pain Clinic, the patients diagnosed with CLBP were invited to the interview by studying their records and calling them. The measures taken in clinical interview sessions were:
1) Semi-structured interview consisted of the basic demographic information and descriptive information about pain such as the main location of the pain, the duration of persistence, severity, cause, therapies and their effectiveness, as well as triggers, reductions, the ways of coping with pain,

and the goal of the patient's treatment. Getting the above information, besides being essential for a comprehensive understanding of the patient, it is the base for therapeutic communication.
2. Familiarity and elimination of ambiguities and misunderstandings about hypnotherapy: The subject's knowledge of hypnosis was questioned and it was tried to discuss the following issues to resolve the ambiguities and misunderstandings about hypnosis.
3. The hypnotizability of the patient was measured using HIP SPIEGEL (1977). In the implementation of HIP test, the eye circling was evaluated as a biological reagent for hypnosis capacity. Moreover, the subjects entered the limited hypnosis with the introduction of "flying hands" and their grades were evaluated in terms of the degree of convergence of the three characteristics of inducibility, absorption and deflection, the difference in sense of control, and the rate of involuntary movements and phenomena.

After that, the intervention phase, consisting of 8 sessions of CBHT based on Donald [7] CBHT guide started. The combination of cognitive talk and hypnotherapy was individualized for each individual according to the formulation of pain and the therapeutic goals specified in the cognitive-behavioral formulation were interfaced with hypnosis pain therapy techniques. The guideline of the sessions is shown in Table 1.

Tools

1. Numerical Pain Rating Scale (NPRS): NPRS is straight line with zero at the one end and number 10 at the other. On this scale, under the number zero, the phrase "no pain" is written and under number 10 "the most severe pain possible" and the line is divided into 11 sections using these numbers. The subject is asked to specify the pain intensity by selecting a numeric value between 0 and 10. The reliability, validity, and sensitivity of this instrument are confirmed by the therapeutic effects [10].

2. Numerical Distress Rating Scale (NDRS): visual analog scales or numerical grading are used to measure distress as a measure of negative emotion index, where 0 represents "nothing" and 10 represents the "highest limit." Cancer patients' studies showed that the visual analogue scale for distress has a high correlation with the total score of hospital depression and anxiety test - which measures 4 negative feelings of depression, anxiety, anger, and the need for help - and has a sensitivity of 74.8 and specificity of 76.9% [11].

Table 1: Guideline of CLBP Sessions

Sessions	The content of the sessions
First session	Cognitive-Behavioral Formulation and Hypnotherapy Formulation
Second session	Changing the sensory experience of pain with techniques such as pain sensitivity, gradual change in perception of pain through separation from body, pain substitution, time distortion, increasing pain tolerance, changing pain location, the development of anesthesia
Third & Fourth Session	Discovering and addressing thoughts or emotions associated with pain, age return technique for emotional exhaustion or emotional experience correction then using one of the techniques of forgiveness, healing spring, red balloon, sacred religious personality and so on
Fifth & Sixth session	Changing attention to positive aspects of self and life and new concepts on having a pain, including techniques of symbolic images, embodiments that emphasize choices and substitutes, and metaphors such as the one-hand hero
Seventh session	Teaching body scan technique for mindfulness and periodic clearing of unpleasant excitement and road health technique for positive coping
Eighth session	Reviewing the treatment course and the main techniques useable in self-hypnosis

RESULTS

The demographic characteristics of the participants in the study are as described in Table 2.

Table 2: Demographic characteristics of participants

Participant	Gender	Age	Marital	Status	Occupation	Disease Experience in years
1	Female	34	Married	Bachelor	Housewife	1
2	Female	56	Married	Diploma	Housewife	2
3	Female	56	Married	Diploma	Employed	3
4	Female	49	Married	Sub-diploma	Housewife	1

- Hypothesis 1: CBHT is effective in reducing perceived pain intensity in patients with CLBP.
- For testing this hypothesis, the intensity of the perceived pain of each participant was compared in baseline, intervention and follow up. This comparison was performed based on perceived pain intensity of each participant in 12 measurements - 4 measurements in the baseline stage, 6 measurements at the intervention stage, and 2 measurements in follow-up (one month after the end of the intervention). Raw scores of repeated measurements of pain intensity during the baseline, intervention, and follow up sessions are presented in Tables 3 and 4.

Table 3: Pain severity scores in the baseline stage

Evaluation	First participant	Second participant	Third participant	Fourth participant
First	7	7	9	5
Second	4	8	8	3
Third	5	7	9	5
Fourth	7	10	9	2

Table 4: Pain severity scores in intervention and follow-up stages

Evaluation	First P.	Second P.	Third P.	Fourth P.
First	2	5	5	1
Second	3	4	4	3
Third	3	3	6	3
Fourth	3	4	7	5
Fifth	2	5	5	1
Sixth	3	3	5	2
First follow up	3	4	6	4
Second follow up	3	4	6	2

The results of tables 3 and 4 are as follows:
The results of intra-situ and inter-situ analyses of the data of the participants are shown in the table below

Table 5: Variables of intra-situ and inter-situ visual analysis of pain intensity of participants

	Participant							
	First		Second		Third		Fourth	
Sequence of positions	A	B	A	B	A	B	A	B
Level								
Median	6	3	7.5	4	9	5	4	2.5
Mean	5.8	2.7	8	4	8.8	5.3	3.8	2.5
Variation range	4-7	2-3	7-10	3-5	8-9	4-7	2-5	1-5
Data overlap								
PND	100%		100%		100%		50%	
POD	0%		0%		0%		50%	

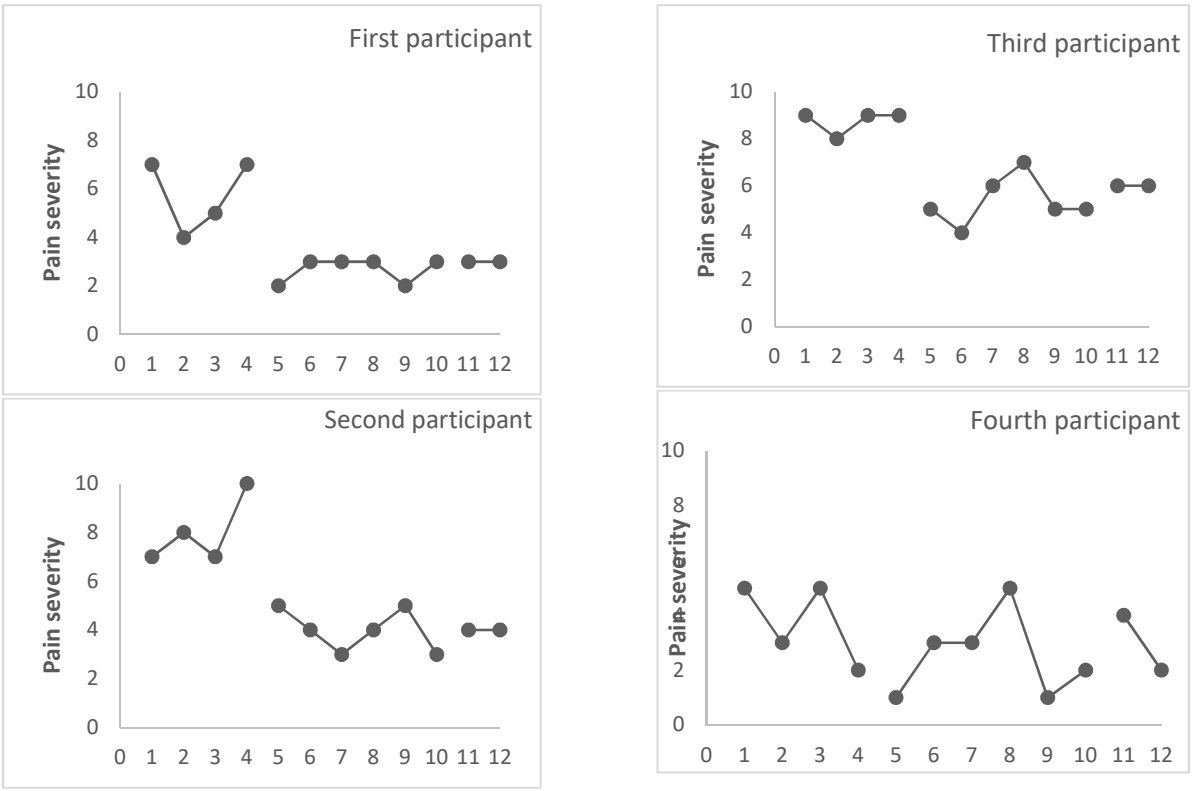

Figure 1: Intensity of pain in participants in the baseline, intervention and follow up stages

As the analysis of the data charts of each of the four participants shows, changes in the levels of perceived pain intensity have been created with the intervention implemented in all four participants and this change is in line with the goals of the intervention. Changes in participants were different but stable. PND index was at an optimal level (50 to 100%). The experimental

control in single-subject research depends on data PND, and as the PND between the two adjacent positions is higher, the intervention can be more effective with greater certainty [12].

Table 6: Distress scores in the baseline stage

Evaluation	First P.	Second P.	Third P.	Fourth P.
First	9	8	10	5
Second	10	9	10	4
Third	9	10	9	5
Fourth	10	9	10	4

Hypothesis 2: CLBP is effective in reducing perceived distress in patients with CLBP.

In order to test this hypothesis, the perceived distress of each participant was compared in baseline, intervention and follow-up stages. The raw grades of repeated measure of distress are given in Tables 6 and 7.

Table 7: Distress scores in intervention and follow-up stages

Evaluation	First P.	Second P.	Third P.	Fourth P.
First	6	5	7	2
Second	4	6	6	4
Third	4	4	7	2
Fourth	4	5	6	2
Fifth	4	4	5	2
Sixth	2	3	5	2
First follow up	5	4	5	3
Second follow up	4	4	5	2

The results of Tables 6 and 7 are plotted as follows

The results of intra-situ and inter-situ analysis of the data of the participants are shown in the table below.

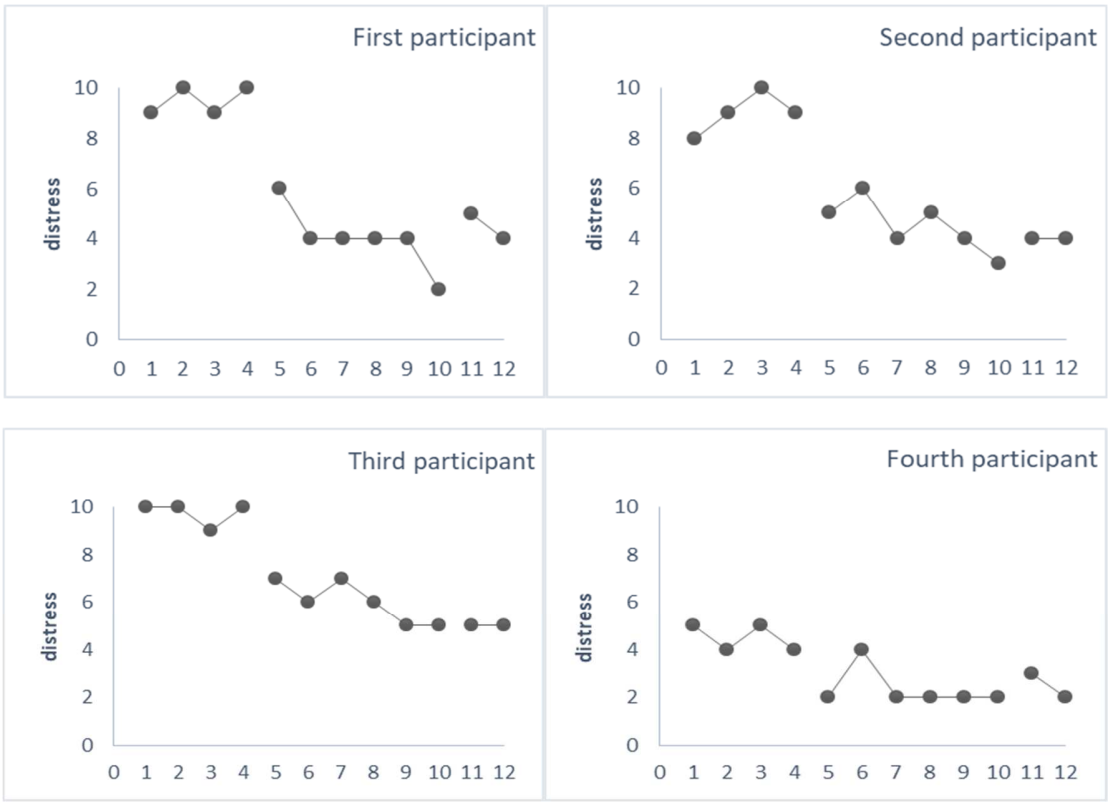

Figure 2: Distress in participants in the baseline, intervention and follow up stages

Table 8: Variables of intra-situ and inter-situ visual analyses of distress of the participants

	participant							
	First		Second		Third		Fourth	
Sequence of positions	A	B	A	B	A	B	A	B
Level								
Median	9.5	4	9	4.5	9.5	6	4.5	2
Mean	9.5	4	9	4.5	9.8	6	4.5	2.3
Variation range	9-10	2-6	8-10	3-6	9-10	5-7	4-5	2-4
Data overlap								
PND	100%		100%		100%		85%	
POD	0%		0%		0%		15%	

As the analysis of the participants' data shows, in each of the four participants, interventions are implemented, changes have been created in the level and process of the perceived distress, and the changes are in line with the intervention purposes. Changes in participants are different but stable. PND index has been at the highest level (85 to 100%), which is a measure of the effectiveness of intervention.

DISCUSSION

These results are in line with the findings of other studies on the effectiveness of hypnotherapy in chronic pain. Two meta-analyses of [13, 14] have confirmed the effectiveness of hypnotherapy for treating chronic pain. Hypnosis-based studies for the treatment of CLBP are few but have generally reported positive outcomes. In the study of [15, 16], the hypnotherapy group reported a significant reduction in pain intensity. Additionally, in the studies of [17], there was a decrease in all variables studied - severity of pain, distress and depression, recovery period, and the rate of use of analgesics.

Considering the first hypothesis, its results were consistent with the cognitive models of pain [18]. Both physiological and psychological factors play an important role in perceiving pain severity. The existence of intermediate variables is confirmed today and active perception rather than passive is emphasized. Due to an extensive study on pain neurophysiology, pain is no longer regarded as a primary sensory message that is detected by somatosensory cortex, but as a result of extensive and parallel processing of the brain [19]. Emotional and cognitive characteristics have significant effects on the perception of pain intensity. Thus, emotional and cognitive changes caused by CBHT, as dynamic processes, affect the perceived pain of the patient. Many studies have confirmed the reduction of clinical pain by manipulating cognitive variables, which has been reviewed and approved in review studies. Moreover, in hypnotherapy, guided illustration reduces pain both as a result of the psycho-physiological effects of relaxed imaginations and with the mechanism of diverting attention [20].

Regarding the second hypothesis, although pain perception is a general process, hypnosis enables patients to differentiate between sensory components and emotional components of pain that are not able to differentiate in non-hypnosis state. Thus, hypnotherapy can effectively affect distress - even in spite of the stability of pain intensity. In CBHT, cognitive reconstruction is done through illustration. Considering the increasing research on the effect of images on emotions and evaluations, as reviewed by [22], visual interventions in CBHT can lead to significant distress reduction in patients.

Limitations and suggestions

In interpreting the results of this study, the following limitations should be considered: as the present study is a single-subject type, the limitations of this type of research is generalizability of the results. Furthermore, as the present study was done on women, care should be taken in generalizing results to men.
Repeating this study with larger samples and the control group can provide generalizable results.

CONCLUSION

Finally, considering the significant changes in reducing of pain and distress in patients, it seems that CBHT affects neurophysiologic processes and automatic functions involved in the interpretation and experience of pain. In CBHT, hypnosis accelerates the relaxation and reliable therapeutic relationships, enabling us to affect the behavior, cognition, perceptions and emotions of the referents in order for treatment. It also gives patients the opportunity to be more active in their therapeutic process, use their internal capacity to control their pain and experience better feelings in individual capabilities and self-empowerment. From the results of this study in confirming the hypotheses, one can conclude that CBHT is effective in relieving pain and distress related to pain. Thus, it can be used as a non-invasive

therapy without side effects in managing and controlling pain in patients with CLBP.

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REFERENCES

1. Rubin D.I. (2007). Epidemiology and risk factors for spine pain. Neurol Clin, 25(2), 353-71.
2. Maetzel, A., Li, L. (2002). The economic burden of low back pain: a review of studies published between 1996 and 2001. Best Pract Res Clin Rheumatol, 16(1), 23-30.
3. Airaksinen, R., Zachariae, R., & Svensson, P. (2006). Effect of hypnosis on oral function and psychological factors in temporomandibular disorders patients. Journal of Oral Rehabilitation, 36, 556–570.
4. Koleck, M., Mazaux, J.M., Rascle, N., & Bruchon-Schweitzer, M. (2006). Psycho-social factors and coping strategies as predictors of chronic evolution and quality of life in patients with low back pain: a prospective study. Eur J Pain, 10(1), 1-11.
5. Gachall, R., Turk, D. (2002). Psychology of Pain: Control and Treatment Approaches. Translator: Asghari Moghaddam, Mohammad Ali, Najjarian, Bahman, Mohammadi, Mohsen, and Dehghani, Mohsen. Tehran: Roshd Publications
6. Roditi, D., & Robinson, M. E. (2011). The role of psychological interventions in the management of patients with chronic pain. Psychology Research and Behavior Management, 4, 41–49. doi:10.2147/PRBM.S15375
7. Robertso, Donald. (2012). The Practice of Cognitive-Behavioural Hypnotherapy: A Manual for Evidence-Based Clinical Hypnosis. Karnac USA.
8. Fathi, M., Fayyaz Saberi, M.H. (2013). Clinical hypnosis. Tehran: Hoor Mehr Publications.
9. Rainville, P., Carrier, B., Hofbauer, R.K., Bushnell, M.C., & Duncan, GH. (1999). Dissociation of sensory and affective dimensions of pain using hypnotic modulation. Pain, 82, 67-74.
10. Jensen, M.P., & Karoly, P. (2001) Self-report scales and procedures for assessing pain in adults. In: Turk, D.C. and Melzack, R. (eds). Handbook of pain assessment 2nd edition, New York, Guilford Press, pp. 15-34.
11. Mitchell, A., & Symonds, P. (2014). Which visual-analogue scales is best at measuring distress? Findings presented at 16th World Congress of Psycho-oncology, University of Leicester.
12. Farahani, H.A., Abedi, A., Aghamohammadi, S., Kazemi, Z. (2010). Methodology of individual cases in behavioral and medical sciences (Applied Approach). Tehran: Dangeh Publications
13. Adachi, T., Fujino, H., Nakae, A., Mashimo, T., & Sasaki, J. (2014). A Meta-Analysis of Hypnosis for Chronic Pain Problems: A Comparison between Hypnosis, Standard Care, and Other Psychological Interventions. Journal of Clinical and Experimental Hypnosis, 62(1), 1–28.
14. Montgomery, G.H., Duhamel, K.N., & Redd, W.H. (2000). A meta-analysis of hypnotically induced analgesia. International Journal of Clinical and Experimental Hypnosis, 48, 138–153.
15. Jensen, M.P., Barber, J. Romano, J.M., Molton, I.R., Raichle, K.A., Osborne, T.L.,. . . Patterson, D.R. (2009). A comparison of self-hypnosis versus progressive muscle relaxation in patients with multiple sclerosis and chronic pain. International Journal of Clinical and Experimental Hypnosis, 57, 198–221.
16. McCauley, J.D., Thelen, M.H., Frank, R.G., Willard, R.R., & Callen, K.E. (1983). Hypnosis compared to relaxation in the outpatient management of chronic low back pain. Archives of Physical Medicine and Rehabilitation, 64, 548–552.
17. Spinhoven, P., & Linssen, A. C. (1989). Education and self-hypnosis in the management of low back pain: A component analysis. British Journal of Clinical Psychology, 28, 145–153.
18. Melzack, R., & Wall, P.D. (1992). The challenge of pain. London, UK: Penguin.
19. Turk, D.C., & Okifuji, A. (2002). Psychological Factore in Chronic Pain:

Evolution and Revolution. J Consult Clin Psychol, 70(3), 678-690.
20. Skevington, S. M. (1995). Psychology of pain. Chichester: John Wiley and Sons Ltd.
21. Hakmen, S. N. and Swicegood, J. (2011). Recruiting Participants with Chronic Conditions in Second Life. In C. A. Hill, E. Dean and J. Murphy (Eds.), Social Media, Sociality, and Survey Research. Hoboken. NJ: John Wiley & Sons, Inc.