



# The Effectiveness of Laminectomy Surgery in Marital Adjustment of Patients with Chronic Low Back Pain

Mahsa Yousefi <sup>1</sup>, Behnam Molaie <sup>2,\*</sup>, Nader Ayadi <sup>3</sup> and Behzad Skandaroghli <sup>4</sup>

<sup>1</sup>Ardabil University of Medical Sciences, Ardabil, Iran

<sup>2</sup>Department of Psychiatry, Ardabil University of Medical Sciences, Ardabil, Iran

<sup>3</sup>Department of Counseling, University of Isfahan, Isfahan, Iran

<sup>4</sup>Department of Surgery, Ardabil University of Medical Science, Ardabil, Iran

\*Corresponding author: Department of Psychiatry, Ardabil University of Medical Sciences, Ardabil, Iran. Tel: +98-9108474236, Email: b.molaei@arums.ac.ir

Received 2020 January 05; Revised 2020 March 28; Accepted 2020 March 31.

## Abstract

**Background:** Chronic low back pain is a common problem in primary care. Low back pain is one of the most common causes of disability that affects different aspects of these patients' lives. One of the aspects that are affected by chronic low back pain is couples' marital adjustment.

**Objectives:** This study aimed to investigate the effectiveness of laminectomy surgery in marital adjustment of patients with chronic low back pain.

**Methods:** The study design was quasi-experimental. The statistical population of this research consisted of all patients with chronic back pain referred to Fatemi Hospital in Ardabil. The instrument used in this research to collect data was Spanier Dyadic Adjustment scale (DAS) distributed once before surgery and once 3 months after surgery. The data were analyzed by dependent *t*-test using SPSS software.

**Results:** Forty persons (55.6%) were female, and 32 persons (44.4%) were male. The results showed that marital adjustment significantly increased after the laminectomy surgery in terms of the following dimensions, marital satisfaction, solidarity, affection, and mutual trust compared to the before surgery ( $P < 0.05$ ).

**Conclusions:** Considering the obtained results, the laminectomy surgery in patients with chronic back pain causes an increase in marital adjustment in terms of all dimensions.

**Keywords:** Laminectomy, Chronic Pain, Low Back Pain

## 1. Background

Back pain is one of the most common causes of disability and forms of non-communicable diseases (1). According to the World Health Organization (WHO), back pain is the most common musculoskeletal complaint that can occur at any time and affect approximately 4% - 33% of the total population (2). If the pain and disability caused by back pain persist for more than 12 weeks, it turns into chronic back pain (3). Patients with chronic back pain face several problems, including functional disability, increased rate of anxiety and depression, and loss of quality of life (4).

In spite of multiple consequences of chronic back pain, researchers have become increasingly interested in the interpersonal nature of chronic diseases over recent years (5). Initial reports on the family life of patients with chronic pain have shown that these patients face widespread marital and sexual problems (6, 7). The literature review of the current related studies shows that

the presence of chronic pain not only imposes mental stress on the person but also exposes the patient to various stressors, affecting different aspects of his/her life (8). Chronic illness impacts the partnership of the person with a chronic illness, and the relationship of patients with relatives and intimate partners is seriously affected (9). From a different point of view, although chronic pain impacts the patients' family, children, and extended family members, the partnership is thought to be most affected. Partners often experience many challenges in everyday life, such as reduced quality of life, the experience of psychological distress, and negative effects on social life (10, 11). Various studies have shown that chronic disease can lead to decreased marital adjustment due to sexual, emotional, and communication problems between couples (12). Marital adjustment is the satisfaction of couples with their marriage (13). Marital adjustment is important, particularly when various factors affect the couple's relationships (14). Chronic

pains and diseases are among the factors that negatively correlate with marriage and marital satisfaction and adjustment (15). Pundits believe that if either one of a couple suffers from chronic pain, it may affect marital satisfaction in both of them (16). Moreover, research has shown that marital satisfaction and spousal behaviors have an impact on physical, psychological, and relationship adjustment in those with pain (5). Following chronic illness, relationship stressors increase the likelihood of negative spousal interaction, thereby predisposing couples to a higher risk of marital distress (17).

For decades, specialists and physicians have used a variety of methods to relieve pain and other problems associated with chronic back pain (18). Lumbar spinal stenosis is one of the causes of back pain (19). Laminectomy surgery is one of the methods used to treat lumbar spinal stenosis. It was used for the first time by Alexander Haden Horsley in 1887 to treat spinal stenosis in London (20). Laminectomy is a type of surgery used to reduce the pressure imposed on the nerve roots exiting from the spine (21). In the view of researchers and health experts of the health area, laminectomy surgery is a standard therapeutic method for patients with lumbar spinal stenosis (22). Despite many marital problems that patients with chronic low back pain experience, the current literature review showed that the treatment of patients with chronic pain and their spouses significantly reduced chronic pain-related problems (7). Therefore, owing to the effectiveness of laminectomy in most aspects of life of people with chronic low back pain, explaining and assessing the changes related to marital adjustment in these patients before and after laminectomy surgery seem necessary. However, no research has been conducted in Iran on the marital adjustment of patients with chronic pain before and after laminectomy surgery.

## 2. Objectives

This study aimed to evaluate the effectiveness of laminectomy surgery in marital adjustment of patients with chronic low back pain referred to Fatemi Hospital in Ardabil.

## 3. Methods

### 3.1. Patient Selection

The study design was quasi-experimental. The statistical population of this research consisted of all patients with chronic back pain and lumbar spinal stenosis referred to Fatemi Educational-Therapeutic Center affiliated to Ardabil University of Medical Sciences in 2018. According to what has been said in other studies and experimental

studies, at least 15 participants must be selected for each group (23). Accordingly, 72 cases, who were candidates for laminectomy surgery, were selected using the convenience sampling method. In this study, the inclusion criteria were having chronic low back pain, living with her/his spouse, no psychiatric problems, signing written informed consent, having at least a diploma. Also, the exclusion criteria were lack of chronic low back pain, living without her/his spouse, unwillingness to continue the research, and having psychiatric problems. In order to conduct the current research, the patients were provided with Dyadic Adjustment scale (DAS) once before the surgery and once 3 months after the surgery because three months after the surgery is a good time to take the necessary breaks and get back to a normal lifestyle with complete capabilities. In order to comply with ethical considerations of research, written informed consent was obtained from all participants, and necessary permissions were obtained from the Ethics Committee of Ardabil University of Medical Sciences.

### 3.1. Spanier Dyadic Adjustment Scale

Dyadic Adjustment scale (DAS) is a self-assessment questionnaire with 32 items that obtain people's perceptions of marital adjustment. The questionnaire scores range from 0 to 151. Getting scores equal to or more than 100 indicates the individuals' marital adjustment and scores less than 100 indicates a problem with marital relationships and lack of adjustment and family understanding. Spinner stipulated the reliability of the total scale as 0.96, Dyadic satisfaction as 0.94, Dyadic consensus as 0.90, Dyadic cohesion as 0.86, and affectional expression as 0.73. Its validity was reported as 0.86 based on Pearson Correlation with Locke-Wallace Marital Adjustment scale Dyadic Adjustment scale. In Iran, Hassan Shah determined the reliability of the scale as 0.96 and 0.92 by using the split-half method and Cronbach's alpha, respectively, and reported the validity of the questionnaire as 0.85 based on its correlation with Locke-Wallace Marital Adjustment scale (14). Also, researchers have demonstrated that the validity and reliability of this questionnaire have been confirmed in various studies. so that the reliability was 0.92 for the total scale by the use of Cronbach's alpha and the validity of this scale was confirmed in chronic illness population (24). The SPSS software version 18.0, was employed for data analysis. The data were analyzed by descriptive statistics i.e., mean and standard deviation and inferential statistics, i.e., dependent *t*-test.

## 4. Results

Out of the total participants under investigation, 40 persons (55.6%) were female and 32 persons (44.4%) were

male. Additionally, most of the individuals were unemployed (n = 40, 55.6%), and individuals with freelance jobs formed 19.4% of the whole research sample population.

The results of dependent t-test show that the mean of all levels of marital adjustment significantly increased after laminectomy surgery compared to before the surgery such that the largest and smallest increments were observed in mutual agreement and expressing affection, and solidarity dimensions, respectively (Table 1).

**Table 1.** Mean Difference Between the Total Score of Marital Adjustment and Its Dimensions Before and After Laminectomy Surgery

Marital Adjustment	Mean Before Surgery	Mean After Surgery	P Value
Satisfaction	32.7	33.9	0.001
Solidarity	15.7	16.1	0.013
Mutual agreement	45.3	47.2	0.001
Expressing affection	9.2	9.7	0.001
Total score	102.8	106.9	0.001

Based on the results of the dependent t-test, it was found that marital adjustment is better among women in terms of satisfaction, mutual agreement, and expressing affection dimensions, but the difference between the two genders is not statistically significant; Table 2).

**Table 2.** Mean Difference Between the Total Score of Marital Adjustment and Its Dimensions Before and After Laminectomy Surgery in Terms of Gender

Marital Adjustment	Gender	Mean Difference	P Value
Satisfaction	Female	1.65	0.08
	Male	0.62	
Solidarity	Female	0.32	0.6
	Male	0.47	
Mutual agreement	Female	2.1	0.5
	Male	1.8	
Expressing affection	Female	0.48	0.9
	Male	0.47	
Total score	Female	4.5	0.2
	Male	3.3	

According to the results of dependent t-test, the rate of mutual agreement and solidarity was low among individuals who had a history of drug addiction, but no statistically significant difference was observed between individuals with a history of drug addiction and other individuals in terms of total score of marital adjustment and its dimensions (P > 0.05; Table 3).

**Table 3.** Mean Difference Between the Total Score of Marital Adjustment and Its Dimensions Before and After Laminectomy Surgery in Terms of a History of Drug Addiction

Marital Adjustment	History of Drug Addiction	Mean Difference	P Value
Satisfaction	Have	1.27	0.9
	Do not have	1.18	
Solidarity	Have	0.36	0.9
	Do not have	0.39	
Mutual agreement	Have	1.63	0.6
	Do not have	2	
Expressing affection	Have	0.64	0.6
	Do not have	0.44	
Total score	Have	3.9	0.9
	Do not have	4	

According to the results of the dependent t-test, the investigation of the relationship between marital adjustment and patient educational levels revealed no statistically significant difference (P > 0.05; Table 4).

**Table 4.** Mean Difference Between the Total Score of Marital Adjustment and Its Dimensions Before and After Laminectomy Surgery in Terms of the Patients' Educational Level

Marital Adjustment	Patient Educational Level	Mean of Differences	P Value
The total score of marital adjustment	Illiterate	4.4	0.7
	Primary school	4.3	
	Guidance school	4.2	
	High school	4.8	
	Associate's degree	2.8	
	Master's degree	2	

## 5. Discussion

This research was conducted to investigate marital adjustment in patients who were considered candidates for laminectomy surgery in Ardebil City. In this research, it was concluded that the mean of marital adjustment levels increased significantly after the surgery compared to before the surgery such that the largest and smallest increments were observed in mutual agreement and expressing affection, and solidarity dimensions, respectively. The findings of this research are in agreement with those obtained

by Farzanegan et al. (25). who demonstrated that lumbar discectomy improved both physical and mental health subscale of the quality of life in patients with chronic disc herniation. In fact, it can be said that the rate of satisfaction after the surgery increases both in terms of the quality of surgery itself and its effect on the marital adjustment rate. In another research, which is in agreement with this study, Skoro et al. (26) showed that if the surgery for lumbar spinal stenosis is accompanied by fusion, it will have a better effect on patients in terms of the clinical symptoms.

To explain the increased marital adjustment of couples after laminectomy surgery, it can be asserted that sometimes the reduction of the quality of marital life, and consequently, loss of marital adjustment of couples with chronic back pain occurs more due to anxiety and defined psychological beliefs in physical problems rather than physiological disability such that the effects of stress in patients with chronic pain are so associated with pain that some researchers have suggested that pain and stress are two distinguished yet overlapping processes, presenting multiple conceptual and physiological overlaps (27). Therefore, chronic back pain can increase marital stress. In this regard, a decrease in stress and distress can increase the marital adjustment of an individual with back pain. Researchers have reported that chronic pain is accompanied by increased psychological distress in families and has a special effect on marital functioning (16). Most of systemic theories in family therapy believe that the existence of stress in either one of the couples can increase stress and tension in the whole of marital life. This mutual stress in marital life, which is expressed based on the systemic concept of circular causality from systemic perspective, has to do with the problem indicating that the behavior and states of either one of the couples not only affect the spouse behavior but also is circularly affected by the spouse's changed behavior or states via its effect on the behavior and states of the other party (28). In fact, the anxiety and distress in a patient with chronic back pain are transferred to the spouse. Therefore, with anxious behavior and reactions of the spouse, the patient with chronic back pain will bear more anxiety because he/she interprets the spouse's distress and discomfort against himself/herself and consider it the result of his/her spouse's concern over his/her physical weakness. Finally, as the anxiety of the patient intensifies and the marital stress increases, the marital adjustment and solidarity decreases. Therefore, it is clear that by performing laminectomy surgery and reducing the severity of these problems caused by chronic low back pain, the distress and stress in the family, and especially in the relationship between couples, are reduced and as a result, their marital adjustment is improved.

To explain another result of the current research, indi-

cating the increased marital adjustment of couples after performing laminectomy surgery, it can be said that the existence of physical disability such as chronic back pain in either one of the couples can reduce the patient's sense of worth and self-esteem by increasing the patient's concern over his/her body image, which has undergone changes in any way, leading to variations in the rate of the sense of worth (23). Following the reduction of the sense of worth and self-efficiency in patients with chronic back pain, these individuals do not have the passion and desire to perform their roles in a desirable way even if they have the ability to perform their roles because of the low self-esteem and worth cause a reduction in the work motivation of individuals. This leads to the loss of the quality of the individual's performance in various spousal, parental, occupational, and social roles. Therefore, the patient's spouse also loses his or her desire to improve and strengthen the relationship as a result of observing the low passion and poor performance of his/her spouse in common life, and following the increased marital burnout, marital adjustment among couples decreases. Therefore, performing laminectomy surgery makes the patient consider himself/herself worthy of a better life by changing the mental image of his/her body and thereby, increasing his/her sense of worth and self-confidence, and following the improved motivation and passion to perform spousal and parental roles and the increased intimate interaction and relationships, the patient's satisfaction with marital life and the couple's marital adjustment increase. To confirm the above-mentioned declarations, researchers believe that individuals with weak body image are less likely to participate in improving relationship behaviors, and thus, they may experience reduced satisfaction with their relationships (29). The fear and avoidance model also states that the inability of individuals with chronic pain in society is among the results of the individual's avoidance of roles and activities (30).

Similar to other studies, this research had several limitations, including the specificity of the sample for patients with chronic back pain who were candidates for laminectomy surgery in Ardebil City. This makes it difficult to generalize the results to patients in other cities. Therefore, it is suggested that in future research in this area, similar studies are done at the national level with a wider statistical population. Also, given the widespread marital problems overshadowed by chronic pain, investigating the effectiveness of laminectomy surgery in each of these dimensions was beyond the scope of the present study. Therefore, it is recommended that further studies be conducted on the efficacy of laminectomy on other aspects of marital and occupational life of patients with chronic low back pain.

### 5.1. Conclusions

The present research showed that the marital adjustment rate in each of the four components of marital satisfaction, mutual agreement, mutual solidarity, and affective expression after laminectomy surgery significantly increases compared to before the surgery. This finding is also confirmed in comparison to similar studies, and its reason seems to be the reduction of stress and improvement of the sense of worth and self-esteem of the patient after getting rid of chronic back pain.

### Acknowledgments

This article came from a professional doctoral thesis in medicine in Ardabil University of Medical Sciences. We extend our thanks to the Research Administration of the Ardabil University of Medical Sciences and all individuals who helped us conduct the study.

### Footnotes

**Authors' Contribution:** All authors participated in all parts of the preparation and submission of the manuscript. All authors read and approved the final manuscript.

**Conflict of Interests:** The authors have no competing interests to declare.

**Ethical Approval:** the required permits for conducting this research were obtained from the Ethics Committee of Ardabil University of Medical Sciences. The Ethics code for this study was IR.ARUMS.REC.1397.095.

**Funding/Support:** This study is not financially supported by any organization or institution and was conducted by the personal expense of the authors.

**Informed Consent:** The study objectives and the voluntary nature of participating in the study were described to all participants, and written informed consent was obtained from all participants.

### References

- Gatzinsky K, Eldabe S, Deneville JP, Duyvendak W, Naiditch N, Van Buyten JP, et al. Optimizing the management and outcomes of failed back surgery syndrome: A proposal of a standardized multidisciplinary team care pathway. *Pain Res Manag.* 2019;2019:8184592. doi: [10.1155/2019/8184592](https://doi.org/10.1155/2019/8184592). [PubMed: [31360272](https://pubmed.ncbi.nlm.nih.gov/31360272/)]. [PubMed Central: [PMC6644221](https://pubmed.ncbi.nlm.nih.gov/PMC6644221/)].
- Russo M, Deckers K, Eldabe S, Kiesel K, Gilligan C, Vieceli J, et al. Muscle control and non-specific chronic low back pain. *Neuromodulation.* 2018;21(1):1-9. doi: [10.1111/ner.12738](https://doi.org/10.1111/ner.12738). [PubMed: [29230905](https://pubmed.ncbi.nlm.nih.gov/29230905/)]. [PubMed Central: [PMC5814909](https://pubmed.ncbi.nlm.nih.gov/PMC5814909/)].
- Qaseem A, Wilt TJ, McLean RM, Forciea MA; Clinical Guidelines Committee of the American College of Physicians. Noninvasive treatments for acute, subacute, and chronic low back pain: A clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2017;166(7):514-30. doi: [10.7326/M16-2367](https://doi.org/10.7326/M16-2367). [PubMed: [28192789](https://pubmed.ncbi.nlm.nih.gov/28192789/)].
- Hong JH, Kim HD, Shin HH, Huh B. Assessment of depression, anxiety, sleep disturbance, and quality of life in patients with chronic low back pain in Korea. *Korean J Anesthesiol.* 2014;66(6):444-50. doi: [10.4097/kjae.2014.66.6.444](https://doi.org/10.4097/kjae.2014.66.6.444). [PubMed: [25006368](https://pubmed.ncbi.nlm.nih.gov/25006368/)]. [PubMed Central: [PMC4085265](https://pubmed.ncbi.nlm.nih.gov/PMC4085265/)].
- Leonard MT, Cano A, Johansen AB. Chronic pain in a couples context: a review and integration of theoretical models and empirical evidence. *J Pain.* 2006;7(6):377-90. doi: [10.1016/j.jpain.2006.01.442](https://doi.org/10.1016/j.jpain.2006.01.442). [PubMed: [16750794](https://pubmed.ncbi.nlm.nih.gov/16750794/)]. [PubMed Central: [PMC1890016](https://pubmed.ncbi.nlm.nih.gov/PMC1890016/)].
- Breton A, Miller CM, Fisher K. Enhancing the sexual function of women living with chronic pain: A cognitive-behavioural treatment group. *Pain Res Manag.* 2008;13(3):219-24. doi: [10.1155/2008/369382](https://doi.org/10.1155/2008/369382). [PubMed: [18592058](https://pubmed.ncbi.nlm.nih.gov/18592058/)]. [PubMed Central: [PMC2671310](https://pubmed.ncbi.nlm.nih.gov/PMC2671310/)].
- Saarijarvi S, Hyyppa MT, Lehtinen V, Alanen E. Chronic low back pain patient and spouse. *J Psychosom Res.* 1990;34(1):117-22. doi: [10.1016/0022-3999\(90\)90015-v](https://doi.org/10.1016/0022-3999(90)90015-v).
- Gatchel RJ, Rollings KH. Evidence-informed management of chronic low back pain with cognitive behavioral therapy. *Spine J.* 2008;8(1):40-4. doi: [10.1016/j.spinee.2007.10.007](https://doi.org/10.1016/j.spinee.2007.10.007). [PubMed: [18164452](https://pubmed.ncbi.nlm.nih.gov/18164452/)]. [PubMed Central: [PMC3237294](https://pubmed.ncbi.nlm.nih.gov/PMC3237294/)].
- Schulz R, Beach SR, Hebert RS, Martire LM, Monin JK, Tompkins CA, et al. Spousal suffering and partner's depression and cardiovascular disease: the Cardiovascular Health study. *Am J Geriatr Psychiatry.* 2009;17(3):246-54. doi: [10.1097/JGP.0b013e318198775b](https://doi.org/10.1097/JGP.0b013e318198775b). [PubMed: [19454851](https://pubmed.ncbi.nlm.nih.gov/19454851/)]. [PubMed Central: [PMC2697395](https://pubmed.ncbi.nlm.nih.gov/PMC2697395/)].
- Merz EL, Malcarne VL, Ko CM, Sadler M, Kwack L, Varni JW, et al. Dyadic concordance among prostate cancer patients and their partners and health-related quality of life: Does it matter? *Psychol Health.* 2011;26(6):651-66. doi: [10.1080/08870441003721251](https://doi.org/10.1080/08870441003721251). [PubMed: [20680885](https://pubmed.ncbi.nlm.nih.gov/20680885/)]. [PubMed Central: [PMC3216478](https://pubmed.ncbi.nlm.nih.gov/PMC3216478/)].
- Eriksson E, Wejaker M, Danhard A, Nilsson A, Kristofferzon ML. Living with a spouse with chronic illness - the challenge of balancing demands and resources. *BMC Public Health.* 2019;19(1):422. doi: [10.1186/s12889-019-6800-7](https://doi.org/10.1186/s12889-019-6800-7). [PubMed: [31014309](https://pubmed.ncbi.nlm.nih.gov/31014309/)]. [PubMed Central: [PMC6480606](https://pubmed.ncbi.nlm.nih.gov/PMC6480606/)].
- Hashmi HA, Khurshid M, Hassan I. Marital adjustment, stress and depression among working and non-working married women. *Internet J Med Update.* 2007;2(1). doi: [10.4314/ijmu.v2i1.39843](https://doi.org/10.4314/ijmu.v2i1.39843).
- Mutlu B, Erkut Z, Yildirim Z, Gundogdu N. A review on the relationship between marital adjustment and maternal attachment. *Rev Assoc Med Bras (1992).* 2018;64(3):243-52. doi: [10.1590/r1806-9282.64.03.243](https://doi.org/10.1590/r1806-9282.64.03.243). [PubMed: [29641776](https://pubmed.ncbi.nlm.nih.gov/29641776/)].
- Dargahi S, Ghamari Giv H, Aeyadi N, Soltani Z. Effect of behavioral-communication couple therapy in dimensions of marital adjustment in infertile couples. *J Res Health.* 2018;8(4):313-21. doi: [10.29252/jrh.8.4.313](https://doi.org/10.29252/jrh.8.4.313).
- Cano A, Johansen AB, Leonard MT, Hanawalt JD. What are the marital problems of patients with chronic pain? *Curr Pain Headache Rep.* 2005;9(2):96-100. doi: [10.1007/s11916-005-0045-0](https://doi.org/10.1007/s11916-005-0045-0). [PubMed: [15745618](https://pubmed.ncbi.nlm.nih.gov/15745618/)].
- Cano A, Gillis M, Heinz W, Geisser M, Foran H. Marital functioning, chronic pain, and psychological distress. *Pain.* 2004;107(1-2):99-106. doi: [10.1016/j.pain.2003.10.003](https://doi.org/10.1016/j.pain.2003.10.003). [PubMed: [14715395](https://pubmed.ncbi.nlm.nih.gov/14715395/)]. [PubMed Central: [PMC2398709](https://pubmed.ncbi.nlm.nih.gov/PMC2398709/)].
- Badr H, Acitelli LK. Dyadic adjustment in chronic illness: Does relationship talk matter? *J Fam Psychol.* 2005;19(3):465-9. doi: [10.1037/0893-3200.19.3.465](https://doi.org/10.1037/0893-3200.19.3.465). [PubMed: [16221026](https://pubmed.ncbi.nlm.nih.gov/16221026/)].
- Hoffman BM, Papas RK, Chatkoff DK, Kerns RD. Meta-analysis of psychological interventions for chronic low back pain. *Health Psychol.* 2007;26(1):1-9. doi: [10.1037/0278-6133.26.1.1](https://doi.org/10.1037/0278-6133.26.1.1). [PubMed: [17209691](https://pubmed.ncbi.nlm.nih.gov/17209691/)].



19. Hoy D, March L, Brooks P, Woolf A, Blyth F, Vos T, et al. Measuring the global burden of low back pain. *Best Pract Res Clin Rheumatol.* 2010;**24**(2):155–65. doi: [10.1016/j.berh.2009.11.002](https://doi.org/10.1016/j.berh.2009.11.002). [PubMed: [20227638](https://pubmed.ncbi.nlm.nih.gov/20227638/)].
20. Gevirtz C. Update on treatment of lumbar spinal stenosis. *Topics Pain Manage.* 2010;**25**(6):1–5. doi: [10.1097/01.Tpm.0000366952.57911.06](https://doi.org/10.1097/01.Tpm.0000366952.57911.06).
21. Saruhashi Y, Mori K, Katsuura A, Takahashi S, Matsusue Y, Hukuda S. Evaluation of standard nucleotomy for lumbar disc herniation using the Love method: results of follow-up studies after more than 10 years. *Eur Spine J.* 2004;**13**(7):626–30. doi: [10.1007/s00586-004-0690-8](https://doi.org/10.1007/s00586-004-0690-8). [PubMed: [15138859](https://pubmed.ncbi.nlm.nih.gov/15138859/)]. [PubMed Central: [PMC3476658](https://pubmed.ncbi.nlm.nih.gov/PMC3476658/)].
22. Machado GC, Ferreira PH, Harris IA, Pinheiro MB, Koes BW, van Tulder M, et al. Effectiveness of surgery for lumbar spinal stenosis: A systematic review and meta-analysis. *PLoS One.* 2015;**10**(3). e0122800. doi: [10.1371/journal.pone.0122800](https://doi.org/10.1371/journal.pone.0122800). [PubMed: [25822730](https://pubmed.ncbi.nlm.nih.gov/25822730/)]. [PubMed Central: [PMC4378944](https://pubmed.ncbi.nlm.nih.gov/PMC4378944/)].
23. Nourbakhsh S, Ayadi N, Fayazi M, Sadri E. Effectiveness of happiness training program based on fordyce cognitive behavioral theory on quality of life and ability to tolerate disorders of women with physical-motor disabilities. *Iran J Rehabil Res.* 2018;**4**(2):35–43.
24. Chiara G, Eva G, Elisa M, Luca R, Piera B. Psychometrical properties of the dyadic adjustment scale for measurement of marital quality with Italian Couples. *Proced Soc Behav Sci.* 2014;**127**:499–503. doi: [10.1016/j.sbspro.2014.03.298](https://doi.org/10.1016/j.sbspro.2014.03.298).
25. Farzanegan G, Alghasi M, Safari S. Quality-of-life evaluation of patients undergoing lumbar discectomy using short form 36. *Anesth Pain Med.* 2011;**1**(2):73–6. doi: [10.5812/kowsar.22287523.1998](https://doi.org/10.5812/kowsar.22287523.1998). [PubMed: [25729660](https://pubmed.ncbi.nlm.nih.gov/25729660/)]. [PubMed Central: [PMC4335744](https://pubmed.ncbi.nlm.nih.gov/PMC4335744/)].
26. Skoro I, Stancic M, Kovacevic M, Duric KS. Long-term results and efficacy of laminectomy with fusion versus young laminoplasty for the treatment of degenerative spinal stenosis. *World Neurosurg.* 2016;**89**:387–92. doi: [10.1016/j.wneu.2016.01.078](https://doi.org/10.1016/j.wneu.2016.01.078). [PubMed: [26852714](https://pubmed.ncbi.nlm.nih.gov/26852714/)].
27. Ayadi N, Dargahi S, Ghamari Givi H, Abbasi M. The impact of job stress on subjective well-being, marital stress and empathy of nurses. *Iran J Med Ethics Hist Med.* 2016;**9**(2):67–79.
28. Abdallah CG, Geha P. Chronic pain and chronic stress: Two sides of the same coin? *Chronic Stress (Thousand Oaks).* 2017;**1**. doi: [10.1177/2470547017704763](https://doi.org/10.1177/2470547017704763). [PubMed: [28795169](https://pubmed.ncbi.nlm.nih.gov/28795169/)]. [PubMed Central: [PMC5546756](https://pubmed.ncbi.nlm.nih.gov/PMC5546756/)].
29. Meltzer AL, McNulty JK. Body image and marital satisfaction: Evidence for the mediating role of sexual frequency and sexual satisfaction. *J Fam Psychol.* 2010;**24**(2):156–64. doi: [10.1037/a0019063](https://doi.org/10.1037/a0019063). [PubMed: [20438191](https://pubmed.ncbi.nlm.nih.gov/20438191/)]. [PubMed Central: [PMC2864925](https://pubmed.ncbi.nlm.nih.gov/PMC2864925/)].
30. Lethem J, Slade PD, Troup JD, Bentley G. Outline of a Fear-Avoidance model of exaggerated pain perception-I. *Behav Res Ther.* 1983;**21**(4):401–8. doi: [10.1016/0005-7967\(83\)90009-8](https://doi.org/10.1016/0005-7967(83)90009-8). [PubMed: [6626110](https://pubmed.ncbi.nlm.nih.gov/6626110/)].