

# The effect of continuing care on patient's quality-of-life after disc surgery in neurosurgery and very important person wards

Nasrollah Alimohammadi, Manijeh Eslami<sup>1</sup>, Hojatollah Yousefi<sup>2</sup>, Homayoon Tabesh<sup>3</sup>

Department of Critical Care Nursing, <sup>2</sup>Department of Adult Nursing, School of Nursing and Midwifery, <sup>1</sup>Neurosurgery Ward, Al-Zahra Hospital, <sup>3</sup>Department of Neurosurgery, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

## ABSTRACT

**Background:** Today, lumbar herniation discs, a prevalent problem with a sign of lumbar and feet pain in society. Removal of disk by surgery decrease pain but reduce quality-of-life (QOL). In some cases, lack of following and caring of patient after surgery, herniation disc recurrent. Previous studies show that patient education and followings is important, therefore, this study aimed to investigate the effect of continuing care on patient QOL after disc surgery in neurosurgery and very important person (VIP) ward in Al-Zahra Hospital. **Materials and Methods:** This study is a clinical trial conducted on 64 patients hospitalized in the neurosurgery and VIP wards of Al-Zahra Hospital, in Isfahan, Iran, in 2013. The patients were selected by simple sampling method and were randomly assigned to two groups (study and control). Patients' response to short form-36 questionnaire before and 4 weeks and 3 months after continuing care in study group, and simultaneously, in the control group. **Results:** Repeated measures ANOVA showed a significant difference in mean of physical and psychological dimensions before and 4 weeks and 3 months after intervention in study group ( $P < 0.05$ ), but in control group, the difference was not significant ( $P = 0.8$ ). Pairwise comparison of mean physical and psychological dimensions at different time points by Fisher's least significant difference showed that there was a significant difference in the intervention group ( $P < 0.022$ ). But in the control group, there was no significant difference between pairs of time points ( $P > 0.18$ ). **Conclusion:** Continuing care improves dimensions of patients' QOL, and it is recommended as a nursing and nonmedical intervention in disc surgery patients.

**Key words:** Continuing care, lumbar disc surgery, nursing, quality of life

## INTRODUCTION

Disc surgery is one of the most common types of surgeries, administrated in the world.<sup>[1]</sup> It is annually implemented by 500,000 cases in US. In western countries, its incidence is about 150 out of 100,000 of which over 90% is for lumbar discs L4 and L5 or between L5 and S1.<sup>[2]</sup> Studies have

reported the prevalence of low back pain between 51% and 84%.<sup>[3,4]</sup> Mirhoseini, in a study in Isfahan, Iran, showed that the causes for patients' herniated disc were lifting heavy things (31.4%), a collapse (10.2%), physical exercises (10%), car accidents (6.1%) and a cough or a sneeze (1.8%), and 40.5% of the cases were idiopathic.<sup>[5]</sup>

Based on a pilot census in medical records of Al-Zahra University Hospital in Isfahan, out of 1186 patients, hospitalized due to lumbar surgery, 1005 patients underwent

**Address for correspondence:** Dr. Hojatollah Yousefi, Department of Adult Nursing, School of Nursing and Midwifery, Nursing and Midwifery Care Research Center, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: yousefi@nm.mui.ac.ir

### Access this article online

Quick Response Code:



Website:  
www.jehp.net

DOI:  
10.4103/2277-9531.171820

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

**For reprints contact:** reprints@medknow.com

**This article may be cited as:** Alimohammadi N, Eslami M, Yousefi H, Tabesh H. The effect of continuing care on patient's quality-of-life after disc surgery in neurosurgery and very important person wards. J Edu Health Promot 2015;4:106.

a disc surgery. Lumbar discectomy is conducted as a common method. Black and Hokanson report that there are some common complications occurring after a lumbar discectomy such as infection, inflammation, and nerve roots injury.<sup>[6]</sup> The lower or upper parts of surgery site may be prone to undergo the process of atrophy, and there is a possibility of relapse at the same level or other levels, which results in making the patient candidate for another surgery.<sup>[7]</sup> Lumbar disc relapse is relatively a common problem,<sup>[8,9]</sup> with prevalence of 5–25%.<sup>[10]</sup> Based on researcher's experience, the patients who do not follow lumbar discectomy postoperative care are involved in a relapse or chronic pain and disability. On the other hand, about 30% of the patients experience chronic pain and disability after a spine surgery,<sup>[11]</sup> which can notably affect individuals' quality-of-life (QOL) and function in all domains.<sup>[12]</sup> QOL in human includes a multidimensional structure in physical, cognitive, emotional, social, and spiritual dimensions, which can be influenced by a spin surgery. Therefore, a reduction in QOL is also expected.<sup>[13]</sup> Among the major changes in QOL, there are changes in activity, sleep, social and occupational function, and sexual relationship as well as the dysfunction in bending down and right and everyday activities, which can lead to more patients' mental and psychological problems and immobility. This issue drives the patients to a chronic process and leads to the economic burden, resulted from prolonged complications such as lowered function, work inefficiency and increased treatment and rehabilitation costs. These complications have a destructive effect on individuals' and their families' QOL and imposes high costs to the patients' and society.<sup>[14]</sup> The economic burden, resulted from lumbar discectomy, accounted for 306 million dollars in US in 2003.<sup>[15]</sup> Therefore, patients' treatment does not seem to be limited to just physical aspects, but the best and most efficient treatment care methods should be suggested to the patients to have a normal life and appropriate QOL. Nurses' attention to patients' QOL not only leads to a closer nurse-patient communication but also is counted as an appropriate index to evaluate patients' function after diagnosis and treatment of lumbar disc.<sup>[16]</sup> Therefore, nursing care not only has a crucial role in patients' need assessment and their fulfillment in various dimensions but also can play a pivotal role in the promotion of their QOL.<sup>[17]</sup> Patients' continuing care can be effective in improvement of their QOL and ability and acts as one of the important nursing interventions. Nurses should meet patients' needs, assess their ability and understand their communication and socials background to be able to play their professional role in the care.<sup>[18,19]</sup> Detection of such abilities and paying attention to them in continuing care by nurses can prevent lumbar disc postoperative complications and driving the patients to a chronic process of complications.<sup>[20]</sup> Continuing care is a process, which is regularly conducted with goal of making an efficient nurse-client communication and interaction among nurses, as the health care providers, to detect patients' needs and problems and to sensitize them to accept continuing health behaviors to facilitate preservation, recovery, and improvement of patients' care.<sup>[21]</sup> Ostelo *et al.*, in a study on the effect of rehabilitation and determination of its most effective mode after lumbar discectomy, showed

that beginning physical rehabilitative exercises 4–6 weeks after surgery decreased postoperative pain and had more effect, if practiced more severely; therefore, there is no need for postoperative immobility.<sup>[22]</sup> When the disorder gets chronic, the economic burden due to a prolonged process, the reduction in function and efficiency, and higher treatment and rehabilitation costs increase.<sup>[23]</sup> These complications also have a destructive effect on patients' and their families' QOL and impose a high economic burden to the society.<sup>[14]</sup> What is done in care, specifically in continuing care, is administration of more nurse-patients interaction,<sup>[21,24]</sup> to give appropriate and vital care,<sup>[25]</sup> conducted in multi-stage frame of awareness, sensitization and education, follow-up, and evaluation.<sup>[26]</sup>

In this program, the patient should participate as the main stakeholder in all stages. Patients' efficient participation necessitates education, making a motivation and administration of counseling.<sup>[27]</sup> An increase in patients' knowledge leads to an increase in their cooperation and abilities, especially if conducted as a group work.<sup>[28]</sup> Shabani (2006) believes that group education gives the individuals a chance to share their viewpoints, beliefs and experiences with others. Their beliefs and understanding can either facilitate or prohibit their motivation for a change.<sup>[29]</sup> Therefore, having a motivation helps the individuals to use their utmost power to achieve their goal, and consequently, achieve a higher level of self-efficacy.<sup>[30]</sup> Group educational sessions can result in a better assessment of patients' condition, detection of their problems and finding the best solution for them.<sup>[31]</sup> Sadeghi *et al.* suggest that patients' participation in group educational sessions provides them with a chance to express their problems and overcome their fear and concerns through exchanging their emotions.<sup>[21]</sup> On the other hand, the importance of continuing care can be revealed to the patients through their sensitization and presenting needed educations to let them feel like an integrated part of care. Therefore, the present study, with regard to nursing roles in care, aimed to define the effect of continuing care program on the remaining ability of the patients to empower their feel of independency and to change their attitude to cope with pain, as well as its effect on improvement of their QOL.

## MATERIALS AND METHODS

This two-group multi-stage clinical trial with before-after design was conducted during September-December 2013. In the present study, continuing care program was independent, and QOL was the dependent variable. Study population comprised of male and female patients with lumbar disc hernia, hospitalized in neurosurgery and very important person (VIP) surgery wards of Al-Zahra Hospital in Isfahan, which is the only special university neurosurgery hospital in Isfahan with a physiotherapy unit. Inclusion criteria were the interest to attend the study, age 18–65 years, complete consciousness, diagnosis of lumbar disc hernia, absence of mental disorders and alternative medicine and being the candidate for lumbar discectomy surgery for the 1<sup>st</sup> time. The sampling was convenient sampling and the subjects were assigned to study

and control groups through random allocation. Data were collected by a two-section questionnaire. The first section included demographic characteristics including age, sex, level of education, occupation, marital status, height, weight, length of the disease, and consumption of sedatives.

The second section contained short form-36 (SF-36) QOL questionnaire including 36 items on physical (four sub-scales) and mental (four sub-scales) domains. Physical dimension includes domains of physical function (10 items), physical role-play (4 items), physical pain (2 items), and general health (6 items). Mental dimension includes energy and happiness (4 items), social function (2 items), emotional role play (3 items), and mental and psychological health (5 items). SF-36 questionnaire was translated in Tehran Jihad Daneshgahi Sciences Research Center and accredited for Iranian culture and society. It has been adopted in various studies, and its Persian version has appropriate reliability and validity in measurement of life health.<sup>[32]</sup> To determine the score of subjects' QOL, mean values of before, and 6 weeks and 3 months after surgery were evaluated with respect to Kulig's study.<sup>[33]</sup> In the present study, the sample size was calculated 32 subjects based on sample size formula and confidence interval = 95% in one-tailed test (1.96) and power of 80% (0.84). The estimation of standard deviation (SD) of QOL score was reported 16.4.<sup>[34]</sup> Mean of the least differences between two groups showed a significant difference ( $s = 0.7$ ). Finally, 110 patients with lumbar disc hernia, hospitalized in neurosurgery and VIP surgery wards of Al-Zahra, were selected through convenient sampling during 60 days of whom 26 subjects were left out of study due to losing their interest, 13 subjects did not meet inclusion criteria, one subject was left out due to naval hernia after surgery, and six were left out due to not attending the educational program.

After assigning the subjects to study and control groups through random allocation by random numbers table, they were explained about the goal of research and their written consents were obtained to attend this research project, approved by University (No = 392,473). Then, personal-QOL questionnaire was completed in both groups a day prior to surgery. After completion of the questionnaire for 10 min, postoperative continuing care program was administrated in study group. Control group just received routine care. Finally, QOL was measured in both groups 6 weeks and 3 months after surgery. Continuing care included four stages. In the first stage, the patients and their accompanying persons attended a 15–30 min session and received common information about the method of surgery, the probable length of hospitalization, physical movement limitation in the 1<sup>st</sup> h after surgery and probable time of discharge. At this stage (immediately after patients' hospitalization), the subjects attended a room in the ward, already allocated in VIP neurosurgery ward. This group session was formed for 4–5 participants. The goal was to have a briefing and to define the stages of continuing care and giving the subjects common information like above in the form of a lecture or presentation of an educational booklet. Finally, the subjects filled QOL questionnaire. The second

stage was stage of sensitization in which the subjects and one of their family members (as the main caregiver) in study group received education after surgery and before discharge about the method of homecare such as bathing, wound care, level of activity, and the contact information (they were given a special phone number). An illustrated educational booklet with pictures of physical exercises was given to them. Then, 4 weeks after surgery, the patients' attended physiotherapy unit of Al-Zahra Hospital and underwent 30–60 min education on the appropriate exercises for muscle strength, the correct way to lift things from the floor, sitting, walking, and climbing up the stairs through an educational booklet. In the third stage, 6 weeks after surgery, the subjects in study group were called in neurosurgery or VIP surgery wards of Al-Zahra Hospital through making necessary coordination and based on a schedule, and the appropriateness of their conducted exercises was checked. At this time and 3 months after lumbar discectomy surgery, the effect of the intervention on subjects' QOL was investigated by SF-36 questionnaire. In the fourth stage (evaluation stage), evaluation was regularly conducted in 3 time points of admission, 6 weeks after surgery and 3 months after surgery in both study and control groups. At the end, after completion and collection of demographic characteristics and SF-36 QOL questionnaire, Chi-square test was used to compare the variables in two groups, independent *t*-test was used to compare means and repeated measure ANOVA was adopted to investigate the changes in QOL through SPSS 18 [SPSS Inc: Chicago.].

## RESULTS

Mean (SD) of age in study and control groups was 39.4 (11.2) and 39.9 (11.3) years, respectively, and mean lengths of disease were 12.4 (13.1) and 15.5 (13.1) years. In study group, 59.4% were male, and 40.6% were female, while in the control group, 46.9% were male, and 53.1% were female. About 81.2% in the study and 90.6% in the control group were married. Most of the subjects in both groups had a history of taking medication when in pain. Comparison of the means showed that both groups were almost homogenous concerning demographic characteristics, sex, occupation, marital status, consumption of medications and the level of education (there was no significant difference between them). Independent *t*-test showed a significant difference in study group in mean changes of QOL scores in the physical dimension 6 weeks and 3 months after intervention, compared to before the intervention ( $P < 0.05$ ). Independent *t*-test showed a significant difference in mean scores of changes in QOL in mental dimension 6 weeks and 3 months after intervention in study group, compared to before while this value showed a significant reduction in control group ( $P < 0.05$ ) [Table 1]. Comparison of mean changes total scores of patients' QOL before, 6 weeks after and 3 months after intervention in study and control groups shows no existing difference between two groups before intervention while the difference was significant 6 weeks and 3 months after intervention. ANOVA showed a significant difference between groups before and after intervention [Table 2]. Least significant difference *post-hoc*

**Table 1: Comparison of mean score changes of subject's QOL in physical and mental dimensions in study and control groups**

Time	Study		Control		Independent <i>t</i> -test	
	Mean	SD	Mean	SD	<i>t</i>	<i>P</i>
Physical dimension						
6 weeks after compared to before	45.34	11.01	18.13	15.12	8.22	<0.001
3 months after compared to before	54.12	10.71	20.94	15.22	10.08	<0.001
Mental dimension						
6 weeks after compared to before	15.24	6.51	7.70	9.31	3.75	<0.001
3 months after compared to before	16.30	9.12	4.77	7.50	5.52	<0.001

SD = Standard deviation, QOL = Quality of life

**Table 2: Comparison of patient's QOL total mean scores before and 6 weeks and 3 months after intervention between study and control groups**

Time	Study		Control		Independent <i>t</i> -test	
	Mean	SD	Mean	SD	<i>t</i>	<i>P</i>
Before intervention	31.50	6.05	31.30	5.08	0.14	0.89
6 weeks after intervention	65.20	7.45	45.40	10.90	8.43	<0.001
3 months after intervention	70.90	8.20	46	10.50	10.60	<0.001
Repeated measure ANOVA						
<i>F</i>	407.02		27.75			
<i>P</i>	<0.001		<0.001			

SD = Standard deviation, QOL = Quality of life

test showed a significant difference in mean total scores of QOL between the study and control groups before the intervention, and 6 weeks and 3 months after ( $P < 0.05$ ). There was also a significant difference between mean total scores of QOL 6 weeks after intervention, compared to 3 months after ( $P < 0.05$ ), but the difference was not significant in control group ( $P > 0.05$ ) [Table 3].

## DISCUSSION

No significant difference was observed in demographic characteristics, sex, occupation, marital status, medication consumption, and level of education between two groups due to application of random allocation. Independent *t*-test showed a significant difference in mean scores of QOL in physical and mental dimensions before and 6 weeks and 3 months after intervention in two groups ( $P < 0.05$ ). Bošković *et al.*, in a study on QOL of the patients with low back pain undergoing prospective conservative treatment, showed that mean physical health decreased at the beginning of treatment (31.1), 3 months after (42.1), 6 months after (48.7), and even after 4 years, while mental health remained steady.<sup>[35]</sup> Meanwhile, our results showed noteworthy changes in physical and mental dimensions. Selkowitz *et al.*, in a study on immediate and long-term effects of physical exercises and education on subjects' physical health, function, and QOL after single level micro discectomy in California, reported improvement in subjects' physical health, function, and QOL.<sup>[36]</sup> In their study, a resistance sport device was needed, and the patients had to do their physical exercises in a certain place, but in the present study, the researcher showed simple physical exercises and administrated continuing care, which needed no tool and was convenient to practice, and reported an improvement

**Table 3: Paired comparison of patient's QOL total mean scores in study and control groups**

Time	<i>P</i>	
	Study	Control
Before intervention compared to 6 weeks after	<0.001	<0.001
Before intervention compared to 3 months after	<0.001	<0.001
6 weeks after intervention compared to 3 months after	<0.001	0.65

QOL = Quality-of-life

in both physical and mental dimension. Kulig *et al.* (2003), in a study on the effect of an interventional program on progression of functional performance in patients undergoing micro discectomy in California, conducted physical exercises intervention for 12 weeks, which were administrated in two phases of 4–6 weeks after surgery and 12 weeks after ending the program.

Their obtained results showed that an intensive exercise program could reduce patients' disability and enhance their function.<sup>[33]</sup> In the present study, continuing care included an exercise program, which started 6 weeks after surgery, continued for 3 months, and resulted in a better QOL in study group. Sharma *et al.*, in a study on early outcomes after discectomy 6 months after surgery in Russia, reported a pain relief in most of the patients ( $P < 0.001$ ), an improvement in disability and a better QOL (like when they were healthy).<sup>[37]</sup> Mean value of changes, caused by discectomy, declares the positive effect of surgery in relieving pain and improvement of patients' QOL. Meanwhile, comparison of the results in study and control groups after intervention showed the noteworthy

effect of the conducted program continuation in the form of a constant follow-up and long-term care. Therefore, the continuing care conducted by nurses can result in patients' rapid return to their life before surgery and prevention of the disease relapse or a need for another surgery. Subjects' QOL was significantly changed in two domains of physical and mental which reveal the high impact of the intervention in the patients' body and mental health.

It can be notified that the effect of the intervention was observed more on the physical dimension, compared to the mental dimension in the present study. It is suggested to investigate the effect of the continuing care program on patients' QOL after lumbar discectomy in form of a functional program, and establish a center for them to refer to receive continuing care in department of health education to have more physical and mental support. With regard to the existing programs in hospitals for patients' education at their time of discharge, our results can be included in patients' education and help the nurses to follow-up the patients at the time of discharge and even at their home.

## CONCLUSION

Our results showed that continuing care programs could improve patients' QOL in physical and mental dimensions. Although the surgery relieves the patients' pain and improves their QOL, the present study like other international studies revealed the effect of constant intervention on improvement of patients' QOL after surgery. Meanwhile, due to the limitations in the present study such as investigating the effect of follow-up just in case of a discectomy surgery, a limited time interval for intervention, and consequently, lack of follow-up for >3 months, these results cannot be generalized for all lumbar surgeries. Therefore, conducting further studies are needed. Suggesting continuing care program for these patients to nursing staff can help the promotion of these patients' care. Further studies in this context are also needed.

## Acknowledgments

Authors greatly appreciate the cooperation of vice-chancellery for research in nursing and midwifery school as well as the neurosurgery and VIP surgery wards of Al-Zahra Hospital and all the clients.

## Financial support and sponsorship

Isfahan University of Medical Sciences.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Lakicevic G, Ostojic L, Splavski B, Roth S, Vlaskovic T, Brekalo Z, *et al.* Comparative outcome analyses of differently surgical approaches to lumbar disc herniation. *Coll Antropol* 2009;33 Suppl 2:79-84.
- Dang L, Liu Z. A review of current treatment for lumbar disc herniation in children and adolescents. *Eur Spine J* 2010;19:205-14.
- Azizpoor Y, Hemmati F, Sayehmiri K. "Prevalence of life-time back pain in Iran": A systematic review and meta-analysis. *SJKU* 2013;18:102-12.
- Mousavi SJ, Akbari ME, Mehdian H, Mobini B, Montazeri A, Akbarnia B, *et al.* Low back pain in Iran: A growing need to adapt and implement evidence-based practice in developing countries. *Spine (Phila Pa 1976)* 2011;36:E638-46.
- Mirhoseini A. Evaluation of 754 surgically treated lumbar disc herniation. *J Res Med Sci* 2003;8:15-18.
- Black J, Hokanson JH. *Medical Surgical Nursing: Clinical Management for Positive Outcomes*. 8<sup>th</sup> ed. St. Louis: Evolve, 2008. p. 240.
- Suzanne CS, Brenda B. *Brunner and Suddarth's Textbook of Medical Surgical Nursing*. 12<sup>th</sup> ed. Philadelphia: Wolters Kluwer, 2010; p. 332.
- Glenn JS, Yaker J, Guyer RD, Ohnmeiss DD. Anterior discectomy and total disc replacement for three patients with multiple recurrent lumbar disc herniations. *Spine J* 2011;11:e1-6.
- Lee JK, Amorosa L, Cho SK, Weidenbaum M, Kim Y. Recurrent lumbar disk herniation. *J Am Acad Orthop Surg* 2010;18:327-37.
- Osterman H, Sund R, Seitsalo S, Keskimäki I. Risk of multiple reoperations after lumbar discectomy: A population-based study. *Spine (Phila Pa 1976)* 2003;28:621-7.
- den Boer JJ, Oostendorp RA, Beems T, Munneke M, Oerlemans M, Evers AW. A systematic review of bio-psychosocial risk factors for an unfavourable outcome after lumbar disc surgery. *Eur Spine J* 2006;15:527-36.
- Breivik H, Borchgrevink PC, Allen SM, Rosseland LA, Romundstad L, Hals EK, *et al.* Assessment of pain. *Br J Anaesth* 2008;101:17-24.
- Wong M, Tavazzi L. Effect of drug therapy for heart failure on quality of life. *J Clin Hypertens (Greenwich)* 2004;6:256-61.
- Fayssoux R, Goldfarb NI, Vaccaro AR, Harrop J. Indirect costs associated with surgery for low back pain – A secondary analysis of clinical trial data. *Popul Health Manag* 2010;13:9-13.
- Weinstein JN, Lurie JD, Olson PR, Bronner KK, Fisher ES. United States' trends and regional variations in lumbar spine surgery: 1992-2003. *Spine (Phila Pa 1976)* 2006;31:2707-14.
- Hernández MA. Treatment of multiple sclerosis and quality of life. *Rev Neurol* 2000;30:1242-5.
- King CR, Hinds PS. *Quality of Life from Nursing and Patient Perspectives*. 3<sup>rd</sup> ed. London: Jones and Bartlett Publisher; 2012.
- Nyatanga L, Dann KL. Empowerment in nursing: The role of philosophical and psychological factors. *J Adv Nurs* 2002;3:234-9.
- Vég A, Rosenqvist U, Sarkadi A. Variation of patients' views on Type 2 diabetes management over time. *Diabet Med* 2007;24:408-14.
- Rambod M, Shabani M, Shokrpour N, Rafii F, Mohammadaliha J. Quality of life of hemodialysis and renal transplantation patients. *Health Care Manag (Frederick)* 2011;30:23-8.
- Sadeghi S, Zerang FA, Ahmadi F, Karimi Zarchi A, Babatabar HD, Ebadi A, *et al.* Effect of applying continuous care model on quality of life in heart failure patients *J Behav Sci* 2009;3:9-13.
- Ostelo RW, Costa LO, Maher CG, de Vet HC, van Tulder MW. Rehabilitation after lumbar disc surgery: An update Cochrane review. *Spine (Phila Pa 1976)* 2009;34:1839-48.
- Last AR, Hulbert K. Chronic low back pain: Evaluation and management. *Am Fam Physician* 2009;79:1067-74.
- Moyle W. Nurse-patient relationship: A dichotomy of expectations. *Int J Ment Health Nurs* 2003;12:103-9.
- Cravene RF, Hirnle CJ. *Fundamentals of Nursing Human Health and Function*. 5<sup>th</sup> ed. Philadelphia Lippincott and Wilkins; 2007.
- Rafieefar SH, Ahmadzad M, Sharifi M. *Comprehensive System of Patient Educational Health in Islamic Republic of Iran*; 2005. 52. Available from: [http://www.behdasht.gov.ir/uploads/1\\_94\\_29.pdf](http://www.behdasht.gov.ir/uploads/1_94_29.pdf). [Last accessed on 2015 Sep 05].
- Stuart GE, Laraia M. *Principles and Practice of Psychiatric Nursing*. 8<sup>th</sup> ed Canada: Mosby; 2005.
- Jansson KA, Németh G, Granath F, Blomqvist P. Surgery for herniation of a lumbar disc in Sweden between 1987 and 1999. *J Bone Joint Surg (Br)* 2004;85-B: 841-7.
- Shabani H. *Teaching Skills, Teaching Methods and Techniques*, Side. 3. Tehran: SAMT publisher, 2006.

30. Afrooz GH, Motamedi F. Self-efficacy and mental health of students in regular and quick-witted. *Iran Psychol* 2006; 6(4):56-60.
31. Baghery H, Memarian R, Alhani F. Survey the effect of group counseling on quality of life in myocardial infarction patients who have been referred to the clinics of Imam Khomeini and Hospitals in Tehran. *J Kalim* 2004;6:89-95.
32. Montazeri A, Goshtasbi A, Vahdaninia M. Translation, reliability and validity of the SF-36 standard tools such Farsi. *Payesh Quarterly*, 2006;5(1):49-56.
33. Kulig K, Beneck GJ, Selkowitz DM, Popovich JM Jr, Ge TT, Flanagan SP, *et al.* An intensive, progressive exercise program reduces disability and improves functional performance in patients after single-level lumbar microdiscectomy. *Phys Ther* 2009;89:1145-57.
34. Stamfeel M, Post M, Kelder J, Gobebe D, Hemel N. Psychometric properties of Aquarel: A disease-specific quality of life questionnaire for pacemaker patients. *J Clin Epidemiol* 2001;24:157-61.
35. Bošković K, Todorović-Tomašević S, Nada Naumović N, Grajić M, Knežević A. The quality of life of lumbar radiculopathy patients under conservative treatment. *VOJNOSANITETSKI PREGLED Journal* 2009; 66(10): 807-812
36. Selkowitz DM, Kulig K, Poppert EM, Flanagan SP, Matthews ND, Beneck GJ, *et al.* The immediate and long-term effects of exercise and patient education on physical, functional, and quality-of-life outcome measures after single-level lumbar microdiscectomy: A randomized controlled trial protocol. *BMC Musculoskelet Disord* 2006;7:70.
37. Sharma M, Chichanovskaya L, Shlemsky V, Petrukhina E. A Comprehensive study of outcome after lumbar discectomy for lumbar degenerative spine disease at 6 months post-operative period. *Open Neurosurg J* 2013;6:1-5.