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The effects of Home Therapeutic Exercise on quality of life of women with back pain

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ABSTRACT A series of inhibiting factors has led women with back pain to be usually recommended staying in bed rest and be banned especially from sport activities. The aim of this study is to evaluate the effectiveness of a home therapeutic exercise protocol on quality of life of women with low back pain. The training program included 2 weeks of practical work and training. Then, with phone supervision and guidance for six weeks and using training CD, patients continued exercises at home. Preliminary tests were repeated every two weeks until the end of the program. Test used included WHOQOL-BREF questionnaire. Statistical analysis was done through ANOVA for repeated measures by SPSS software. Statistical analysis showed that for factor of quality of life there is a significant interaction in favor of the experimental group. According to the results obtained, it can be concluded that home therapeutic exercise with the protocol presented in this study has been effective on improvement of quality of life. In total, according to the physical benefits of therapeutic intervention used, this approach can be introduced as a valuable therapeutic way to improve back pain patients.

KEYWORDS : iquality of life, low back pain, exercise therapy, SPSS

1. Introduction

Back pain is a pain that is felt in upper back and lower layers of muscle between the ribs and hip and may be associated with foot pain or not (8).

Prevalence and economic costs: Back pain is one of the most common musculoskeletal problems in developed countries and about 80 percent of the people are infected at least once during their lives (9). Each year, about 15 to 37% of clients referring to specialized treatment centers of musculoskeletal problems are patients with back pain (10).

The population characteristics and complications of the disease: back pain is one of the most common causes of disability and functional limitations of lots of people between the ages of 20 to 45 years (1). Back pain however occurs deprives the normal motion and function of the patient. It is why among musculoskeletal disorders, back pain causes the greatest limitation in the workplace and is the second cause of absence from work (11). If severe pressure is not applied to the waist, 90% of back pains are treated spontaneously during a period of three months (13, 12). Common treatments: different treatments are recommended for back pain that include a wide range of methods from modern medicine (drug therapy, surgery) to various methods of complementary alternative therapies (such as acupuncture, chiropractic, and osteopathy) and physical treatments. Therapeutic effects of this technique are still not well-understood (14). Various treatment methods focus on relieving pain, reducing disability, and returning patients to activities of daily living (15, 16, 17 and 18).

Potential benefits of exercise therapy for the target population: Many studies have shown that people who exercise regularly are less likely to suffer lower back pain (19 and 20). In addition, exercise therapy is one of the most common procedures used widely to treat back pain (20).

Exercise therapy is prescribed alone or in combination with other treatments. Clinical guidelines of exercise therapy for chronic low back pain are varied, but their ultimate goal of all pain is pain relief and improvement of functions of the patients (21, 22 and 23).

Patients with chronic low back pain have weak trunk muscles compared to healthy individuals (24). Positive results of exercise therapy on Chronic Lower Back Pain (CLBP), especially for those who have a weak trunk muscles are proven (25, 26 and 27). The weakness exists in muscle strength, endurance, and flexibility (28).

In the study by Farahpour et al. (2002), reduction of pain and improvement of lumbar flexor isometric forces were seen after 12 sessions of exercise therapy (4). In a study of Bani Gol et al. (2008), decreases in pain and lumbar stabilization were observed after Pilates exercises for six weeks (3).

In the study by Kiani Dehkordi et al., pain reduction and increase in range of motion in the hip joint angle of 56 female patients with low back pain for one year that had gone through twelve sessions of Pilates training session was observed (5). In the study by Bakhtiyari et al. (2004) a significant increase in trunk flexion range, increase in the angle (SLR), and rapid performance of everyday activities (functional improvement of patients) was observed after 4 weeks of exercise protocol in sixty patients with disc herniation (6). In the study by Ghiasi et al (2006), reduction in pain and disability was observed in 34 patients with chronic low back pain after 14 sessions of Williams and stabilization exercises (7).

In the study by Samadi Pour et al. (2008), the effects of three different ways of exercise therapy were studied on pain and disability in patients with chronic mechanical low back pain. The results showed that exercises done in all three groups, with emphasis on muscle strengthening exercises of spine could be effective in reducing pain of the patients. Nevertheless, Williams and McKenzie exercises are always performed in static conditions and strengthen a specific muscle group. However, in stabilization exercise in addition to strengthening muscles in static conditions, their strengthening is done in dynamic conditions as well (8).

In the study by Maryam Bagheri et al. (2013), improvement in the quality of life was observed in four dimensions: physical function, mental health, general health, social functioning after two months of training (2).

2. Research Methodology

Regarding the results, this study is applied. In terms of the structure, it is quasi-experimental and prospective. In this study, the effect of the independent variable (8-week home exercise therapy) on 6 dependent variables of physical fitness (general static strength of flexors of the trunk, hip flexors endurance, endurance of the lumbar extensors, general dynamic strength of flexors of the trunk, back

and hamstring flexibility, and general endurance) of women with back pain is evaluated. The population was female patients who referred to the orthopedic department of Mehr Yazd hospital of Isfahan with age range of (30-50 years) and back pain for more than three months. Of the patients, the ones willing to participate in pre- and post-test or those naturally not showing high commitment to the program were used as controls, and thus exercise therapy group and exercise therapy groups were formed. Two-week exercise program (three sessions per week) was practical training, then patients with a guide disc corresponding movements in three-phase continued training exercise for two months.

Physical exams were repeated until the end of the program every two weeks, so that based on that feedback is given to patients considering their improvements and refinements related to overload.

The study stages in the control group included 1) pre-test, 2) period of two months after the test, 3) and post-test. In the experimental group, we had eight weeks of treatment and three tests. The stages included, 1) Pre-test, 2) two weeks of exercise therapy with the help of trainer, 3) mid-test one, 4) two weeks of exercise therapy with the help of educational CD, 5) mid-test two, 6) two weeks of exercise therapy with the help of educational CD, 7) mid-test three, 8) two weeks of exercise therapy with the help of educational CD, and 9) post-test.

In exercise protocol, the experimental group did exercise for eight weeks, three sessions per week, 30-45 minutes each session. The first two weeks was with the training of the researcher training and following six weeks with the help of CD at home. Training was done in three phases 1, 2 and 3 in three separate CDs given to patients. Performance enhancement was done from a supine position to sitting and standing was in three phases. In designing the selected training of this project, several features had been considered: 1) the main objective is overcoming the hamstring weakness, waist, back, quadriceps, and weak short abs, hamstrings, and calves. 2) in choosing movements, attention is paid to eliminate the root of the problem (depreciation of vertebrae) and the individual is prepared for sleeping, sitting, standing, and walking, 3) engaging deep muscles with fine spin-on, clicking movements, and fine movement, 4) attention to the chain integration of joints and action on joints farther from the center of pain in the early phases, 5) start with open chain and gradual approaching of closed chain (progressive overload), 6) course of objectives : increased range of motion, endurance, strength, balance, and power from a supine position to standing, 7) attention to the high level of ability of the individual and that chronic pain should be tolerated and its definite cure is out of reach, and 8) in this research, on the one hand, by calculating compliance coefficient, the practicality of the exercise programs designed for is specified. On the other hand, it is specified that over a period of two months how much of progress this sport program creates in physical fitness. In case of success of the exercise program, patients could be recommended consider it in their lifestyle.

Quality of life was measured using Short Form of WHOQOL-BREF. The questionnaire contains 26 questions and measures quality of life in four dimensions: physical, psychological, social, and environmental aspects.

This standard questionnaire is derived from 100-question version and dates back to 1994. Hundreds of prominent scholars from different countries and dozens of international health groups are involved in its standardization and production in 19 different languages (29 and 30).

3. Results and findings

In this study, home treatment training effect on quality of life and its four factors was studied. Intragroup elements of the research were two tests (before and after training). Intergroup element was classification based on participation and non-participation in training courses during 8 weeks of practice. Accordingly, research had one experimental group (n = 14), and a control group (n = 15). For each of the four psychosocial variables of quality of life test, one analysis of variance for repeated sizes was taken.

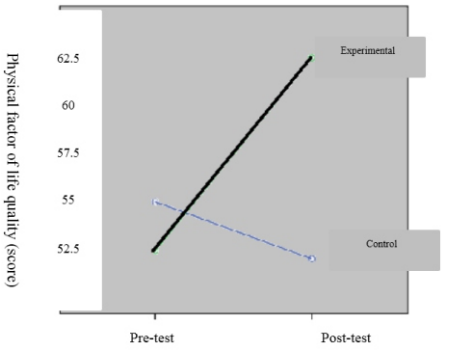

Figure 4.9: Line chart of test changes in quality of life (physical factor) in two tests

Description of Figure 4-9: test values of the quality of life (physical factor) in experimental and control groups were 54.0 and 56.2, respectively, in the pre-test. The quality of life (physical factor) in experimental and control groups were 53.7 and 56.2, respectively, in the post-test. Comparison of interactive changes (slope of change lanes of research groups) has significant differences, so there is no need for other comparisons. They are seen in Figure 4-8, it is seen that the slope of the experimental group is quite different from the control group.

This difference is statistically significant (P=0.000 and F (1 and 27)=72.8).

Result: in training course, the experimental group has 15% progress in quality of life (physical factor), while control group has 4% regress. The general conclusion is that therapy exercise can improve quality of life score (physical factor).

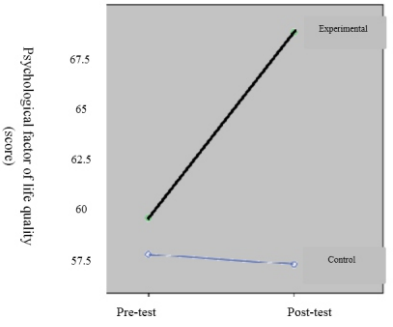

Figure 4.10: Line chart of test changes in quality of life (psychological factor) in two tests

Description of Figure 4-10: test values of the quality of life (psychological factor) in experimental and control groups were 54.1 and 56.2, respectively, in the pre-test. The quality of life (psychological factor) in experimental and control groups were 62.4 and 53.71, respectively, in the post-test. Comparison of interactive changes (slope of change lanes of research groups) has significant differences, so there is no need for other comparisons. They are seen in Figure 4-10, it is seen that the slope of the experimental group is quite different from the control group

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This difference is statistically significant (P=0.000 and F (1 and 27) =24.2)

Result: in training course, the experimental group has 15% progress in quality of life (psychological factor), while control group has 4.5% progress. The general conclusion is that therapy exercise can

improve quality of life score (psychological factor).

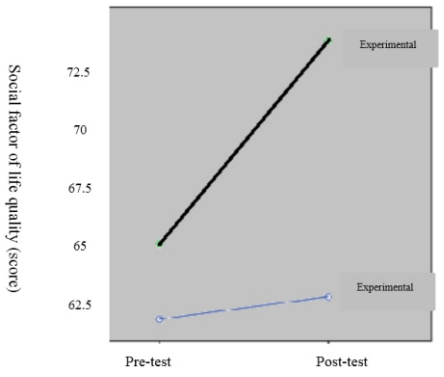

Figure 4.11: Line chart of test changes in quality of life (social factor) in two tests

Description of Figure 4-11: test values of the quality of life (social factor) in experimental and control groups were 65.2 and 62.2, respectively, in the pre-test. The quality of life (social factor) in experimental and control groups were 73.3 and 63.1, respectively, in the post-test. Comparison of interactive changes (slope of change lanes of research groups) has significant differences, so there is no need for other comparisons. They are seen in Figure 4-11, it is seen that the slope of the experimental group is quite different from the control group

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This difference is statistically significant (P=0.013 and F (1 and 27) =7.12).

Result: in training course, the experimental group has 12% progress in quality of life (social factor), while control group has 1% progress. The general conclusion is that therapy exercise can improve quality of life score (social factor).

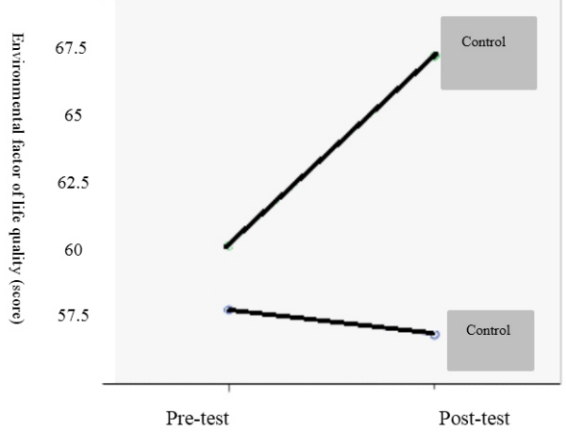

Figure 4.12: Line chart of test changes in quality of life (environmental factor) in two tests

Description of Figure 4-12: test values of the quality of life (environmental factor) in experimental and control groups were 60 and 57.8, respectively, in the pre-test. The quality of life (environmental factor) in experimental and control groups were 57 and 66.4, respectively, in the post-test. Comparison of interactive changes (slope of change lanes of research groups) has significant differences, so there is no need for other comparisons. They are seen in Figure 4-12, it is seen that the slope of the experimental group is quite different from the control group.

This difference is statistically significant (P=0.000 and F (1 and 27) =24).

Result: in training course, the experimental group has 11% progress in quality of life (environmental factor factor), while control group has 1% regress. The general conclusion is that therapy exercise can improve quality of life score (environmental factor factor).

Table 4-8: Summary of ANOVA of repeated data in Chapter 4

Factor	group	pre-exam	Post-test	Difference	F and P values differences		
		SD ± mean	SD ± mean		Intergroup df (27 and 1)	Interaction df (27 and 1)	Intragroup df (27 and 1)
Physical factors (Scale 100)	Experimental	4.94 ± 54.8	4.17 ± 62.4	7.65	**2.42 (0.131)**	**72.8 (0.000)**	**21.5 (0.000)**
	Control	6.98 ± 56.2	7.1 ± 53.7	-2.48			
Psychological factor (Scale 100)	Experimental	5.33 ± 58.8	3.97 ± 67.4	8.57	**5.43 (0.028)**	**24.2 (0.000)**	**19.6 (0.000)**
	Control	9.83 ± 57.1	9.17 ± 56.7	-0.44			
Social factors (Scale 100)	Experimental	6.5 ± 65.2	10.8 ± 73.3	8.09	**3.73 (0.064)**	**7.12 (0.013)**	**11.1 (0.003)**
	Control	10.6 ± 62.2	10.9 ± 63.1	0.89			
Environmental factors (Scale 100)	Experimental	8.5 ± 60	5.43 ± 66.4	6.43	**5.46 (0.044)**	**24.0 (0.000)**	**14.2 (0.001)**
	Control	8.6 ± 57.8	7.57 ± 57	-0.83			

Discussion and conclusion

In this section of the study, the results related to the impact of exercise therapy on quality of life of patients with low back pain are discussed. Factors measured in quality of life are physical health, mental health, social relations, and environmental factors. These factors have a major role in determining the mental health community. Then, the psychosocial factors studied are discussed separately, and at the end of the Results in all psychosocial factors are summarized.

One of the key components used to assess the health and well-being of a person is his ability to perform activities of daily living. To perform daily activities, it is essential to have a healthy musculoskeletal system and in case of having plenty of strength, endurance, and this is obtained by having flexibility. Without enough of musculoskeletal readiness, general quality of life and health of the person decrease. Regular physical activity has a significant impact on physical and mental health (31). Quality of Life Questionnaire assesses four dimensions: physical health, mental health, social relations, and environmental factors. There is no doubt that the objective improving of physical fitness will improve physical and mental health scores. The question is how social relations and environmental factors improve with the improvement of physical fitness. The answer is that each person's has two parts: those he knows (family, friends, colleagues) and unfamiliar ones (those whom we see randomly daily). In social relations, individual with physical disabilities is as a burden on the shoulders of others, a burden many people are fed up with or may want to take advantage of this too. This situation makes the physically disables person not feel independent and free for action and his quality of social relations quickly reduces. In dealing with the environment, it is the same. The environmental conditions questioned in the questionnaire have been safety, security, health, environmental health, economic conditions, access to information, entertainment facilities, residential facilities conditions, access to health services and access to transportation. At first glance, it may seem that these are the activities beyond the individual (related to the duties of the

institutions and social organizations) and things as exercise therapy should have minimal impact on them! In a deeper look, we will notice that in each case of the environmental conditions, physical needs of the disabled are far more severe and more costly and correspondingly less likely to effectively be addressed. This is particularly apparent in our country, as in the design of our environment related institutions have done nothing for specific needs. In this study, quality of life was measured by the World Health Organization Quality of Life Questionnaire. The questionnaire has four dimensions: physical health, mental health, social relations, and environmental factors that are evaluated. The results of this study were similar for all four aspects of quality of life and showed that during the period of study, the experimental group had a significant improvement, while a significant increase was not observed in the control group. This finding suggests that exercise therapy promotes the four dimensions of quality of life. The results of this study are consistent with the results by Domolin et al. (2006), Koyman (2004), Chatezitodor et al. (2007). In a study, Chatezitodor et al. (2007) examined the effects of high-intensity aerobic exercise compared to passive interventions performed in patients with low back pain. The results showed that exercise in exercise therapy-group pain, disability and psychological problems were lessened and no change was observed in the control group (32). In a study, Koyman et al. (2004) studied the impact of a training program in several aspects in people with back pain. Evaluation included physical examination, disability, and psychological factors. The main objective of the program was to enable the patients to go back to work. The study showed that improving flexibility and reducing pain and disability are important factors for returning to work (33). In a study, Domolin et al. (2006) examined the good effects of exercise program in patients with chronic low back pain after the book "Waist in patients with backache." They studied pain, quality of life and ergonomic testing and physical testing after a period of three months. Reduction of pain and enhanced quality of life were observed in both groups. However, its intensity was higher in the exercise group (34). In the analysis of psychosocial factors, it was showed how home exercise could strengthen the quality of life factors (in four dimensions: physical health, mental health, social relations, and environmental factors).

References

1. Sadat, M. 2001. "Knowledge of diseases of bone and Arthritis orthopedic-guide for: Patients, students and general practitioners "first edition, Cultural Institution Press publication Teimourzadeh.
2. Bagheri, M., Toufanian, p, Amin Shokravi, F. 2013. The impact of educational programs for the prevention of low back pain in improving the quality of life of nurses of Valie-Asr hospital. Master's thesis, Faculty of Medical Sciences, Tarbiat Modarres University.
3. Banigel, F. 2007. The effect of Pilates exercises and Williams on chronic low back pain. MA thesis, Tehran University of Physical Education.
4. Farahani, A., Shabani, K. 2008. Back pain (prevention and treatment) emphasize corrective exercises and exercises, Kashefane Majd, First Edition.
5. Farasati, E., Kiyani, Kh., dehkordi. 2009. The effect of therapeutic stretching to keep the resistance point and release on changes in patients with chronic low back pain, hip, movement and exercise science journal, the sixth year, Volume II, Number Twelve, 22-11.
6. Bakhtiari, H., farokhi, Z., Ashtary, Z. 2004. The effect of stabilization exercises in patients with lumbar disc herniation, Journal of of Rafsanjan Medical Sciences. 3 (2): 156-165.
7. Ghiyasi, F., Akbari, A., Sangtarash, F. 2006. Williams and stabilization exercises influence on behavior with mechanical chronic low back pain. Journal of Medical Sciences of Shahrekord. 8 (4): 21-28.
8. Samadi Pour, A., Okhovatian, F., Kahrizi, S, 2005. Comparison of three methods of exercise therapy on pain and disability in patients with chronic mechanical low back pain, Journal of Medical Council of Islamic Republic of Iran. 36 (3): 321-329.
9. Hadavi, F. 2010. Measurement and evaluation in physical education concepts and tests. Third Edition, University press of TarbiatModarres.
10. Emam, H. 2003. Survey of different kinds of backache during pregnancy. J of Medical Faculity Guilan University of M edical Sciences; 44(11): 65-60.
11. Kelsey JL,White, AA., Pastides H.,et al.1979. : The impact of masculoskeletal disorders on the population of the United States.J Bone Joint Surg 61A:959 – 964.
12. Lary Durstine, J., Geoffrey, E., Patricia, L., scott, O.2010. Acsms exercise; management for persons with chroni diseases and disabilities, 266-270.
13. Kinkade, S.2007. Evaluation and treatment of acute low back pain. Am Fam physician. April; 75(8): 1181-8.
14. Salehi, Kh., Naseri, F. 2000. Nomination sideview mental-social patients with choronic back pain. Gongres superficial back pain; Tehran, Iran.
15. mohseni bandpei MA. 2000. chronic low Back Pain: a randomized controlled Trial of spinal manipulation Measuring Pain, Functional Disability, Lumbar Movement and muscle Endurance Using Surface Electromyography (ph.d thesis).school of occupational therapy and physiotherapy , University of East Anglia , Norvich , UK.
16. Schlager, A. 2002. Accupressure reduce post-operative vomiting in children after strabismus surgery, Anesthesia, 86(2) 276.
17. Poiraudeau, S., Rannou, F., Revel, M. 2007. Functional restoration programs for low back pain: a systematic review. Ann Readapt Med Phys; 50: 425–29.
18. Lang, E., Liebig, K., Kastner, S., Neundo, B., Heuschmann, P. 2003. Multidisciplinary rehabilitation versus usual care for chronic LBP in the community: effects on quality of life. Spine J; 3: 270–76.
19. Kaapa, EH., Frantsi, K., Sarna, S., Malmivaara, A. 2006. Multidisciplinary group rehabilitation versus individual physiotherapy for chronic nonspecific low back pain. Spine; 31: 371–76.
20. Johnson, RE., Jones, GT., Wiles NJ et al. 2007, Active exercise, education, and cognitive behavioral therapy for persistent disabling low back pain. Spine; 32: 1578–85.
21. Douglas PG, Michele CB. 2005. Factors influencing result of functional capacity evaluations in workers' compensation claimants with low back pain. Phys Ther; 85:315–322.
22. Hayden JA, van Tulder MW, Tomlinson G. 2005. Systematic Review: strateges for using exercise therapy to improve outcomes in chronic low back pain. Annals of Internal Medicin ;142 (9): 172-181.
23. Machado LAC, Azevedo DC, Capanema MB, Neto TN, Cerceau DM. 2007. Client-centered therapy vs exercise therapy for chronic low back pain: a pilot randomized controlled trial in Brazil. Pain Med; 8: 251–58.
24. Taylor NF, Dodd KJ, Shields N, Bruder A. 2007. Therapeutic exercise in physiotherapy practice is beneficial: a summary of systematic reviews 2002–2005. Aust J Physiother; 53: 7–16.
25. Albright J. 2001. Philadelphia panel evidence-based clinical practice guidelines on selected rehabilitation interventions for low back pain. Phys Ther; 81: 1641–74.
26. Emami, M.J., Abdinejad, F., Nazarizadeh, H, 1998. Epidemiology of low back pain in women, Iran journal medical science, 23(3&4), pp116-119.
27. Ho CW, Chen LC, Hsu HH et al. 2005. Isokinetic muscle strength of the trunk and bilateral knees in young subjects with lumbar disc herniation. Spine; 30: E528–33.
28. Storheim K, Holm I, Gunderson R, Brox JI, Bo K. 2003. The effect of comprehensive group training on cross-sectional area, density, and strength of paraspinal muscles in patient's sick-listed for subacute low back pain. J Spinal Disord Tech; 16: 271–79.
29. WHOQOL-BREF. Introduction, administration, scoring and generic version of the assessment. Field Trial Version. 1996. Programe on mental health organization Geneva.
30. Dundar P, Fidaner C, Fidaner H, Oral A, Eser S, Atman UC, Pala T. 2002. Comparing the Turkish versions of WHOQOL-BREF and SF-36: Convergent validity of WHOQOL-BREF and SF-36. HIPPOKRATIA, 1: 37-43.
31. Kagan K, O Kuhn U. 2004. Exersise and pregnancy. HERZ-MUNICH, 29(4): 426-434.
32. Chatzitheodorou D &et al. 2007. A pilot study of the effects of high intensity aerobic exercise versus passive intervention on pain, disability, psychological strain, and serum cortisol concentrations in people with chronic low back pain. American Physical therapy Association.87:304-312.
33. Koopman FS&et al. 2004. Effectiveness of a multidisciplinary occupational training program for CLBP. American Journal of physical medicine and rehabilitation.
34. Demoulin CH, Maquet D &et al. 2006. Benefits of a physical training program after back school for chronic low back pain patients. Journal of Musculoskeletal Pain, Vol.14(2).