

Effect of Progressive Muscle Relaxation on the Fatigue and Quality of Life Among Iranian Aging Persons

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Abstract- Since the elderly population is increasing rapidly in developing countries which may decrease the physical activity and exercise and in turn could affect the elderly's quality of life, this study aimed to investigate the effect of progressive muscle relaxation on the elderly's quality of life in Iran. In a randomized clinical trial, participants were randomly divided into intervention and control groups. For the intervention group, muscular progressive relaxation was run three days per week for three months (totally 36 sessions). In relaxation, a patient contract a group of his/her muscles in each step and relaxes them after five seconds and finally loosens all muscles and takes five deep breaths. Each session lasts for 45 minutes. The instrument of data gathering consisted of questionnaires on individual's demographic data and quality of life SF-36. After intervention, quality of life increased significantly in the patients undergoing muscular progressive relaxation and fatigue severity decreased significantly in the intervention group compared to prior to intervention. In addition, there was a statistically significant difference in mean score of physical performance, restricted activity after physical problem, energy, socially function, physical pain, overall hygiene, and quality of life between intervention and control groups. By implementing regular and continuous progressive muscle relaxation, quality of life could be increased in different dimensions in the elderly and the context could be provided to age healthily and enjoy higher health and autonomy. Therefore, all of the therapeutic staffs are recommended to implement this plan to promote the elderly's quality of life.

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Introduction

Prosperous and happy aging requires comprehensive welfare in all health aspects (1). The elder people could experience several unpleasant events and consequently more physical, social, and economic difficulties compared to other age groups (2), so their quality of life (QOL) can be affected by increasing chronic diseases and potentially related disability, and increased costs of healthcare system and long-term caring for this age group (3,4).

The population of the elderly (i.e., the age of 60 years and above) was estimated to be approximately about 841 million people in 2013, which comprises 11.7% of global population. It is also expected the elderly population to exceed than two billion people in 2050 (5). World health organization (WHO) has declared that the population of over 65 years will exceed

in the near future (6,7). In Iran, the growth of the elderly population will also extremely increase, which requires financial, social, health, and otherwise supports; in fact, the elderly population (the age of 60 years and above) was estimated about 6205998 in 2011 (6,8).

Therefore, Iran population is aging, and it is necessary to predict the potential needs of the elderly to meet their needs and support their QOL (9). Moreover, World Health Organization (WHO) defines the QOL as individual's perception of their position in life in the context of culture and value systems in which they live and in relation to the objectives, expectations, communications, and needs (10-12). Maintaining the elderly's QOL at high level consists of decreasing the effect of chronic diseases and promoting the ability to live independently of public health-related concerns (13). Several problems occurring physiologically in

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elderly have been found to contribute to decreased QOL in elderly (14). Fatigue is highly prevalent and has a negative impact on QOL and performance in a variety of disorders (15-17).

Attention must be paid to the effective factors on QOL in the course of treatment and healthcare of the elderly (6). Some interventions such as progressive muscle relaxation could contribute to decreasing the tensions caused by chronic diseases, psychological tensions, anxiety, depression, and pain; therefore, the QOL could be improved in the elderly and their healthcare providers through mitigating such problems (18,19). Progressive muscle relaxation (PMR) or active relaxation is referred to a technique through which an individual causes a feeling of calmness in his/herself progressively by actively contracting and then loosening specific muscle groups (18). Full calmness is felt thanks to PMR within at least 4-5 sessions. It is recommended that this approach is conducted twice or three times per day (19). Relaxation is an important component of many approaches of supplementary and alternative medicine which influences main therapies such as hypnotism (20).

Research investigating the effect of relaxation on QOL in the elderly undergoing open heart surgery indicated a change in different QOL dimensions and promotion of QOL caused by relaxation in the studied patients (21). In another research on the effect of deep muscle relaxation on QOL in the patients with prostate cancer, individual mental dimensions and general dimensions related to QOL changed significantly in the intervention group compared to the control group (22). In a study on PMR on hypertension in myocardial infarction patients, PMR caused a decrease in systolic and diastolic blood pressure in myocardial infarction patients with hypertension history (23).

Despite notable advancements made concerning the elderly and study of the elderly worldwide nowadays, this phenomenon is still being addressed traditionally in Iran and paucity of scientific resources in this regard required to promote the elderly insight and knowledge and their families' as primary assistants are greatly felt to achieve the purposes of health promotion. Considering the above studies which explained the effect of PMR on the elderly's QOL, and since elderly population is growing in Iran, so this study was aimed to investigate the effect of progressive muscle relaxation on fatigue, pain, and QOL among Iranian age population by conducting a randomized control trial.

Materials and Methods

This clinical trial was conducted obtaining the necessary permission of Research and Technology Deputy at Shahrekord University of Medical Sciences, Shahrekord, Iran. Numbers of 80 patients were randomly selected for our study (40 patients in each group). Subjects were randomly allocated (matched for gender and age) into two equal groups. The randomization code was developed with a computer random-number generator to select random permuted blocks. For data gathering, systematic random sampling was used. Throughout the study, 20 patients were excluded from the study (10 from each group) due to surgery, lack of consent, and supplementary therapies. Then, the samples were randomly assigned to two intervention and control groups. To obtain the participants' written consent to be enrolled in the study, they were asked to fill out a letter of consent form after explaining the research purposes for them. In addition, the participants were ensured that all research data will be kept as confidential and used only for research purposes. The ethical approval (with ethics code of 89.1.9) was obtained from Ethics Committee of the Shahrekord University of Medical Sciences, and registration code of IRCT20133070213768N3 was issued by Iranian Registry of Clinical Trials for this study.

Inclusion criteria

Inclusion criteria were: No neurologic deficits (stroke, Parkinson's disease, and paralysis), lack of cardiovascular disease (acute myocardial infarction, acute heart failure, and uncontrolled hypertension) and no unstable chronic diseases (diabetes, malignancy). In addition, the ability to perform the exercise program after the medication therapy, no difficulty with movement (such as rheumatoid arthritis, fractures, etc.), no heart transplant three months after exercise program, no advanced heart failure, and no traveling during the research were determined as other inclusion criteria.

Exclusion criteria

By contrast, supplementary therapies, surgery throughout the study, and unwillingness to continue participating in the study were considered as exclusion criteria for the study. In the intervention group, PMR was trained to participants through displaying the movements in practice by the respected expert and researcher. PMR plan was used by the experts at Tarbiat Modares University for some diseases like multiple

sclerosis, cancers, etc. and its value has been already confirmed (24).

Instruments

The SF-36 is a general QOL instrument measuring eight health related concepts including: physical function (PF-10 items), role limitations because of physical problems (RP-4 items), body pain (BP-2 items), general health perception (GH-5 items), Vitality (VT-4 items), Social function (SF-2 items), role limitations because of emotional problems (RE-3 items) and perceived mental health (MH-5 items) (25).

After ensuring the appropriate understanding and implementation of the method, audio cassettes and CDs of relaxation steps were handed out to the participants in order to implement relaxation three times per week for three months (totally 36 sessions) under the supervision of researcher and related expert (19). After three months of program implementation, the questionnaires were filled out by the researcher in the presence of the participants. For relaxation, patients contracted a group of the muscles in each step, relaxed them after five seconds, and finally loosened all muscles and took five deep breaths.

Each session lasted for 45 minutes (26,27). The exercise started until heart rate reached equal to 60% of heart rate reserve. Each participant exercised based on his/her ability and resistance. The exercise was stopped

when participant was physically tired or faced severe dyspnea, fatigue, dizziness or other problems that could jeopardize participant health. Participant in the control group received educational support but no exercise protocol; to assess the quality of life, the Persian version of quality of life questionnaire SF-36 was used. SF-36 assesses the patients’ quality of life in various aspects, physical, mental, psychological, and social. Validity and reliability of this questionnaire’s Persian version have been obtained as acceptable in previous studies (28,29). The Chronbach’s alpha of questionnaire was more than 0.80 (30). Also, to assess fatigue researchers used the 9-item fatigue severity scale (FSS) that is one of the most commonly used self-report questionnaires to measure fatigue (17). FSS contains 9 questions with a rating scale of 1 to 7. 1 indicates “strongly disagree” and 7 indicate “strongly agree. This scale measures the total fatigue (physical, psychological, behavior, social and emotional) (17).

Statistical analysis

The data were analyzed by descriptive statistics (mean and standard deviation [SD]), independent t-test, paired t-test, and one-way ANOVA using SPSS 18. The level of significance (*P*) for all tests was considered <0.05.

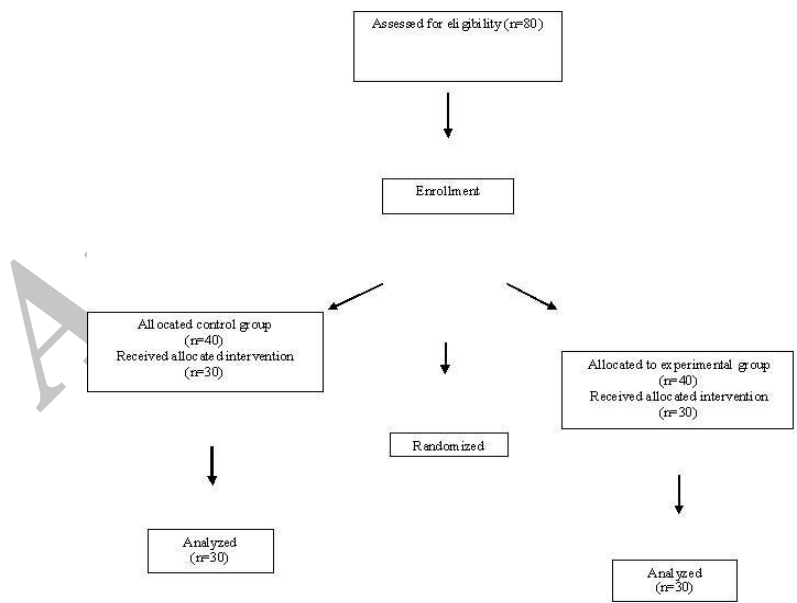


Figure 1. Flowchart of the participants enrollment

Results

The mean age of participants in intervention and

control groups was 65±3 and 66±4 years respectively. In intervention and control groups, respectively 86.6% and 90% were married. Number of 60% of the intervention

group and 56% of the control group were female. For education, 36.6% of the intervention group and 43/3% of the control group were illiterate. In addition, 66% of intervention group and 73% of control group owned a personal home. In intervention and control groups, respectively 92% and 91% were covered by treatment insurance (Table 1).

Prior to intervention, there was no significant difference in the mean score of physical function, activity restriction after physical problem, energy and fatigue, social function, physical pain, public health, and quality of life between intervention and control groups (Table 2).

Table 1. Demographic characteristics of study population

Variable	Intervention		Control		P	
	N	%	N	%		
Sex	Male	12	40	13	44	>0/05
	Female	18	60	17	56	
Total		30	100	30	100	
Marital status	Married	27	90	26	86.6	>0/05
	Single	3	10	4	13.4	
Education	Illiterate	11	36.6	13	43.3	>0/05
	Elementary	9	30	8	26.7	
	Guidance	4	13.4	3	10	
	Diploma	5	16.6	4	13.4	
	Academic Education	1	3.4	2	6.6	
Total		30	100	30	100	
Housing	Owner	20	66	23	73	>0/05
	Renter	10	34	7	27	
Total		30	100	30	100	

Table 2. Mean scores of quality of life' aspects in intervention and control groups at enrollment into the study

Quality of life	Group		Test result
	Intervention group	Control group	
	Mean and SD	Mean and SD	
Physical function	66.7±19.4	67.4±18.1	P>0.05
Role playing	45.7±29.4	43.1±21.4	P>0.05
Pain	61.2±20.5	61.4±19.5	P>0.05
Public health	53.3±15.2	52.7±14.3	P>0.05
Vitality and freshness	49.1±18.3	47.5±15.4	P>0.05
Social function	83.9±23.6	83.4±20.7	P>0.05
Emotional function	40±29.5	39.7±27.2	P>0.05
Mental health	37.2±16.3	37.2±16.3	P>0.05

However, the findings indicated that there was a statistically significant difference in the quality of life score between intervention and control groups after the intervention so that PMR caused an increase in and promotion of quality of life and health in patients in the intervention group. But, no change was noted in the patients' score of quality of life in the control group

(Table 3).

Also, the results showed there was no significant difference in the mean score of fatigue severity prior to the intervention between intervention and control groups, but there was a statistically significant difference in fatigue severity between intervention and control groups after the intervention (Table 4).

Table 3. Mean scores of quality of life' aspects in intervention and control groups at completion of the study

Quality of life	Group		Test result
	Intervention group	Control group	
Physical function	83.2±14.3	66.3±17.2	<i>P</i> <0.05
Role playing	67.5±25.3	43.5±20.2	<i>P</i> <0.05
Pain	77.6±12.4	72.2±17.5	<i>P</i> <0.05
Public health	78.3±11.1	51.6±12.1	<i>P</i> <0.05
Vitality and freshness	73.2±10.2	52.3±15.1	<i>P</i> <0.05
Social function	97.5±8.5	82.2±18.9	<i>P</i> <0.05
Emotional function	71.8±23.1	38.8±28.1	<i>P</i> <0.05
Mental health	63.1±12.2	37.1±14.7	<i>P</i> <0.05

Table 4. Fatigue severity between intervention and control groups after the intervention

Group	Intervention			Control		
	Pre	Post	Sig	Pre	Post	Sig
Mild (10-27)	8(20)	14(35)		10(25)	10(25)	
Moderate (28-45)	15(37.5)	20(50)	<0.05	14(35)	12(30)	>0.05
Sever (46-63)	17(42.5)	6(15)		16(40)	18(45)	

Discussion

The present study was conducted to investigate the effect of PMR program on quality of life in the elderly in Iran. The findings indicated that different aspects of quality of life were promoted after intervention by PMR technique. Several studies, consistent with the present study, indicated that different aspects of quality of life (physical, mental, social, etc.) were promoted after intervention by this technique in the patients with multiple sclerosis, prostate cancer, irritable bowel syndrome and posttraumatic stress disorder (22,31,32). The findings indicated that the quality life was increasingly promoted in mental dimension in the intervention group after intervention. Other studies showed that muscular relaxation could lead to a decrease in depression, anxiety, and stress in female university students with pre-menstrual syndrome, and patients with multiple sclerosis and AIDS (32,33). Other studies also found that this therapeutic approach positively affects the decrease in anxiety and promotion of mental health in the patients with stroke (34). The findings indicate that muscle relaxation technique affects mental aspect more pronouncedly than other aspects of quality of life. Other studies, consistent with the present study, have found the effect of this technique on mental aspect as more pronounced and more research has examined this aspect. It is worth mentioning that this therapeutic approach is basically considered as one of the therapeutic approaches in psychiatry, and therefore such

findings do not seem too surprising. The present study offered muscle relaxation as an approach to relieve the pain in elderly; other studies are in agreement with the present study and confirm the pain relief through this approach. In a systematic review, the effect of muscle relaxation on breast cancer was studied. Seven articles found this approach as contributing to pain and distress relief in breast cancer patients (35). In a study comparing two non-pharmacologic approaches, PMR and music therapy, on pain in cancer patients, the effect of muscle relaxation was significantly higher than that of music therapy. It could be argued that this non-pharmacologic approach caused pain relief and finally promotion of quality of life in cancer patients (36).

The present study found the effective role of muscle relaxation technique in fatigue severity decrease in the elderly; consistent with this finding, this technique was found as an effective and economical approach, capable of being learned and implemented conveniently, and contributing to fatigue decrease in the patients with multiple sclerosis (32). As other studies have demonstrated the positive effect of exercise on the elderly quality of life and muscle relaxation technique could be classified as physical and mental exercise, its regular implantation is recommended for the elderly (6,19).

The findings of the present study indicated that PMR caused an increase in individual's ability to do daily activity independently of others and positively affected other aspects of quality of life such as role playing, physical pain relief, public health, vitality and freshness,

social function, emotional function, and overall hygiene. In addition, PMR caused an increase in physical function and individual independence in doing daily activities. Regarding the findings of the present study, we can conclude that the elderly quality of life could be promoted, their fatigue severity can be mitigated, their independence in doing daily activities is further increased, and finally, they can help achieve a prosperous and healthy aging through implementing a regular program of PMR, and regular and continuous physical activity. Therefore, implementing such programs accompanied with fun exercise activities in nursing homes and/or by healthcare providers is recommended to promote the health.

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