

## EVALUATING THE EFFECTIVENESS OF TWO TYPES OF EXERCISES, FIELD EXERCISE WITH DIRECT SUPERVISION (FEWDS) AND REMOTELY EXERCISE (TELE-EXERCISE) ON THE QUALITY OF LIFE OF THE ELDERLY MAN

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### ABSTRACT

The rate of growth of the elderly population is very high due to lower birth rates and increased health and medical progress, especially in developing countries. In addition, the quality of life at aging has declined for many reasons, including lack of physical activity and exercise, and it is necessary to seek new technology-based solutions in the context of lack of mobility in society, especially for the elderly. The aim of this study was to increase the quality of life in 3 dimensions of objective, subjective and health in the elderly and compare the effectiveness of two types of exercise programs with FEWDS and Tele-Exercise. Materials and Methods: This Semi-experimental study was conducted in 2017 in Isfahan. 60 healthy elderly men, having the ability to perform sports activities, and doing routine and daily tasks without any dependence on others and without systemic and restrictive diseases, were selected by available sampling method and randomly divided into two experimental (FEWDS and Tele-Exercise) and one control groups. The experimental groups received similar pre-scheduled exercises as training interventions for 8 weeks, 3 sessions per week, and 90 minutes each session. The quality of life of the three groups was evaluated before, after intervention and follow-up through ComQoL and EHRQoL questionnaires. Descriptive statistics were used for data analysis and their homogeneity and ANOVA for repeated measurements were used to analyze the data.

Results: The use of a sports program, both FEWDS and Tele-Exercise, significantly increased the quality of life in all three dimensions of mental, objective and quality of life health, compared to before the exercise program ( $P > 0.001$ ). However, in the same period in the control group, no significant changes were made in their quality of life dimensions. Also, in the follow up phase, both experimental groups showed a significant increase in quality of life compared to the control group ( $P > 0.001$ ).

Conclusion: According to the findings of the research, it can be deduced that the use of a regular and continuous exercise program as Tele-exercise can be considered as an alternative to FEWDS exercise programs due to the increase in the quality of life, it should be noted that, tele-exercise training seems to reduce risks and potential damage to the elderly age group was more effective and paved the way for healthy aging and being healthy in this life span.

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**Introduction**

One of the most sensitive periods of human life is elderly, and attention to the issues and needs of this era is a social necessity [1]. Given the specific needs of this era, attention to health promoting behaviors and the quality of life in the elderly is also very important, which is usually neglected [2]. It's the right of all human beings to live a lifetime to a healthy old age and it adds to the importance of the phenomenon of aging and the prevention of its problems [3]. Nowadays, nearly 31 countries each have more than 2 million elderly people over the age of 60 who are being added day by day to these countries [4]. The population of the elderly over the age of 60 is more than 605 million people and is estimated to reach 2 billion by 2050 [5,6]. This is far more than the growth of the child's population [6,7]. In developing countries where our country (Iran) is also one of these countries, the rate of growth of the elderly population is higher than in advanced countries [8,9]. More than half (59%) of the world's elderly population are currently living in developing countries, and it is estimated to reach 71% by 2030 [10,11]. One of the main reasons for this is the decline in mortality due to advances in medical science, health, and education and as a result, raising the life expectancy and longevity, is of such importance That the lack of attention to that human community in the near future Facing issues and problems is much more complicated and possibly insoluble.

In this regard, Barry's study suggests that about 60 percent of healthcare costs, 35 percent of hospital clearance and 47 percent of hospitals admission days are spent by the elderly. Due to the rapid increase in the number of elderly people, the issue of health and providing comfort and well-being of their community and the wider finds new dimensions every day. Given the rapid increase in the number of elderly people, the issue of health, Hygiene and the provision of comfort and welfare in the community Every day, it finds new and wider dimensions [12]. What that Today's knowledge Thereto Attention, the only prolong the era Life is not, it should be noted, however, that the extra years of human life will eventually end in comfort and physical and mental health. And if such conditions are not met, scientific developments to provide longer life will be ineffective and risky [13]. Today, due to increased Longevity and life expectancy index, an even more important issue is how Lapse Longevity, in other words, quality of life [14].

Introduction The quality of life was introduced in the United States about 50 years ago, and the social sciences have been guided by planning and measuring it, over time, and especially over the past two decades, many efforts have been made to assess the quality of life in medical sciences and particularly its investigation in clinical trials were conducted on different people [15]. In the definition provided by Viver in 2001 and accepted by many scholars, the quality of life is to harvest a person's health status and satisfaction of these conditions. Quality of life "harvest any person of their health status and satisfaction of this condition" is defined [16].

Attention to quality of life and the impact of different psychological considerations and lifestyle modifications can greatly increase the efficiency and independence of the elderly and help them control many complications of aging and various therapies [17]. Successful aging or having a high-quality well-being period by Rowe et al is described by three aspects: Lack of illness, compatibility with life and having mental and spiritual competence [18,19]. High quality of life in old age means having a good feeling, working better throughout the day, and having an independent life in most cases [20]. One of the things that may have contributed significantly to improving the quality of life of the elderly is regular and continuous physical activity [21]. Regular and group physical activity in adults and young adults prevents cardiovascular diseases, diabetes and other systemic diseases, and increases life expectancy in individuals. The purpose of this method (physical activity) in the elderly is to Coping with weakness, the Vulnerability caused by physical inactivity, the Physiological changes resulting from aging, chronic diseases, mental health, and the rehabilitation of acute and chronic diseases [22,23]. In a study by Phoemsapthawee and Leelayuwat in Thailand in 2017 conducted on the elderly, it has been shown that a low intensity exercise program has a significant impact on quality of life in both physical and Subjective health and mental health [24]. In a study by [25], they examined the effect of regular and group physical activity on the quality of life and well-being of the elderly within 6 months, they reached to this conclusion that regular and group physical activity can increase the quality of life and feel good in people [25]. In addition, in a study by [26] they examined the effect of continuous physical activity on the mental performance of the elderly person, it has been shown that this program can increase the level of mental performance of individuals [26]. Also, [27] examined the effect of the exercise program on the health status of elderly people and concluded that a regular exercise program would increase physical and mental performance of individuals [27]. Physical activity and exercise are among the methods used to prevent, delay, and cure problems caused by the aging process And its positive impact on people's lives has been well proven [28]. Active lifestyle and physical activity lead to the empowerment and improvement of the quality of life of the elderly because most elderly people voluntarily adopt a sedentary lifestyles, this approach ultimately leads to a reduction in individual autonomy and self-sufficiency [29]. [30] reported that elderly people using a regular exercise program in their lifestyle would benefit from better quality of life and, consequently, longer lifespan and higher muscle strength than other elderly people, and it also threatens them with lower risk of falling [30]. As the quality of life of older people decreases for many reasons, such as inactivity and sedentary activity, the proper use of sports programs will lead to significant improvements in the quality of life of the elderly [31]. In this regard, Patterson et al. they compared the effectiveness of a supervised exercise program with an adequate home-based exercise program to improve walking and quality of life in the elderly and they found that the exercise program under supervision there is a significant improvement over the sports program without observation

[32]. In addition, the effectiveness of Cyberspace-based exercises at home (CBEH)<sup>1</sup> on low back pain [33], neck pain [34] and other musculoskeletal disorders [35] can be mentioned which are also common problems in the elderly.

The purpose of this study was to investigate and compare two types of field exercise with direct supervision (FEWDS) and remotely exercise (Tele-Exercise) on quality of life indicators in the male elderly group.

## Methods

The present study is a semi-experimental, applied and prospective study with three group design with training interventions in both experimental and control groups as well as with pre-test, post-test and follow-up in all three groups. It should be noted that this study was designed for random allocation of samples to experimental and control groups and according to the practice intervention on the elderly, it is also a randomized controlled trial (RCT).

The statistical population of the study included all elderly men 55 years of age above Isfahan city, among whom 160 were selected after screening for general and targeted inquiries (Initial examinations and tests through General Health Questionnaire, Short Form of Mental Status, Physical Fitness Readiness, and Interviews and Explaining the Benefits and Disadvantages of the Research) and Finally, 60 people were selected according to the results and volume of the previous studies, as targeted and available, and randomly divided into three groups of 20 people (All participants of the consent form and personal information questionnaire were received) And in this study, it is also possible for subjects to be homogeneous in terms of age, height, body mass, and body mass index.

Inclusion criteria the study: Men over 55 years, with functional independence and ability to walk and perform daily activities without the use of assistive device and also the lack of regular physical activity and exclusion criteria the study: Received a score of under 24 from a short form of mental status questionnaire, lack of general health and physical fitness readiness questionnaire, presence of acute myocardial infarction and hypertension, history of sensory-motor disorders or severe visual problems, Pathologic signs, history of fracture, surgery and arthritis in the lower limb, use of sedative and analgesic drugs 48 hours before the test, any abnormality in the lower extremity, Having a history of falling over the past year, the inability to perform quizzes or training programs, and participating in regular out-of-study exercises.

Independent variable in this study was intergroup factor, or the same the implementation of FEWDS and Tele-Exercise for 8 weeks, and the dependent variable in this study was quality of life and its related indicators. In this study, we tried to prevent specimens from being exposed to other exercises, as well as the underlying variables with random allocation of samples among the three groups and using statistical tests to be controlled.

The tools used in this study were to record initial information including consent form, demographic information registration form, general health questionnaire, Physical activity readiness questionnaire and short form of mental status questionnaire were used to record quality of life data from the Cummins quality of life questionnaire (ComQol) and the quality of life questionnaire related to the health (Elderly Health- Related Quality of Life (EHRQoL)) of the elderly.

The Cummins Quality of Life Questionnaire (ComQol) (1997) examined the values of individuals in two dimensions (ICC = 0.76) and mental (ICC = 0.81). This is a questionnaire of seven material areas (home, Ownership, Earnings), Hygienic (Physician, disability or medical condition), Intimacy (conversation, care, activity), Social base (social activity, responsibility, consultation), Productivity (work, extra time, TV), Emotional well-being (ability, sleep, dreams) and security (sleeping house and anxiety) was measured. In this study, the health aspects and its direct effects on all seven areas related to this questionnaire have been considered [36, 37].

Elderly Health-Related Quality of Life (EHRQoL) questionnaire (2012) has a high validity and reliability in the health of elderly people. The questionnaire has 51 items (phrases) in a five-point Likert scale. This questionnaire includes six fields of social inclusion ability, including 9 phrases, family cohesion including 8 phrases, mental health including 10 phrases, spiritual wellbeing including 6 phrases, independence 6 phrases. And not feel sick including 11 phrases and a total score as health-related quality of life of seniors provides [38].

A training program used as an intervention in this study, tried to be based on the training pattern designed by Martini and Dignau (2014), for elderly people [39] in the style of the ultimate-Fit<sup>2</sup>, they will be executed in the same way for both groups of exercises. In this exercise program, warm up from 5 to 10 minutes, with 15-30 minutes of resistance training, and 15 to 30 minutes of aerobic training and 15 to 30 minutes of balance training, And 5 minute cool-down is used, workouts per week are increasingly based on the ability of the samples increased.

FEWDS in a hall Indoor was held (Figure1). Tele-Exercise at home each person and through the internet and use the Hangouts software, Google-owned companies was conducted (Figure2). In this study only one Theraband was used to perform resistance training and its color and strength were also selected based on body type and physical characteristics of the subjects.

<sup>1</sup> A type of tele-exercise exercise

<sup>2</sup> Ultimate-Fit, a practice style invented by Abarghoyan and developed by him and Babaei Khorzoghi, and it has been confirmed by experts, in this style, we try to use a combination of training programs in different sets and heart rates remain normal, it should be noted that the increase in load in this training pattern is based on the ability of individuals to adjust.



**Figure1.** How to implement an exercise program in the form of FEWDS



**Figure 2.** How to implement an exercise program in the form of tele-exercise and interactive

In order to analyze data, descriptive statistics were used for data linking and data was analyzed using. The statistical software used was SPSS version 22.

### Results

After analyzing the data in the descriptive section and analysis of variance as shown in Table 1, it was found that the experimental groups FEWDS, Tele-Exercise and control with respect to age, height, weight, and body mass index (BMI) are identical.

**Table 1.** Compares the homogeneity of the two groups in terms of demographic variables

|                 | Control Group<br>(mean±SD) | Experimental<br>FEWDS Group<br>(mean±SD) | Experimental Tele-Exercise<br>Group (mean±SD) | Sig   |
|-----------------|----------------------------|--|---|-------|
| Age             | 62.58±5.68                 | 64.28±6.44                               | 63.28±6.12                                    | 0.380 |
| Height          | 1.72±0.05                  | 1.71±0.04                                | 1.72±0.04                                     | 0.863 |
| Weight          | 72.71±9.28                 | 72.16±8.33                               | 73.19±8.63                                    | 0.926 |
| Body mass index | 24.58±2.52                 | 24.68±2.43                               | 24.74±2.48                                    | 0.956 |

The results of the ComQol Questionnaire and EHRQoL Questionnaire in each of the three groups (FEWDS, Tele-Exercise and control) are shown in Table 2 below. There is no significant difference between mean and standard deviation of quality of life before intervention and also in control group after intervention ( $P>0.05$ ), However, there is a significant difference between the mean of quality of life after intervention in both groups of intervention FEWDS and Tele-Exercise Group, respectively.

**Table 2.** Describes the quality of life between groups in the pre-test, post-test and follow-up

| Groups                                 |                   | Pre-test     | Post-test    | Follow-up    |
|--|-------------------|--------------|--------------|--------------|
| Experimental<br>FEWDS Group            | subjective ComQol | 95.13±5.60   | 115.21±6.45  | 113.11±6.30  |
|  | objective ComQol  | 90.34±6.70   | 109.31±7.56  | 102.24±6.63  |
|  | EHRQoL            | 180.46±15.32 | 225.27±16.26 | 220.31±16.14 |
| Experimental<br>Tele-Exercise<br>Group | subjective ComQol | 93.17±5.43   | 111.28±6.28  | 107.33±6.46  |
|  | objective ComQol  | 87.54±5.98   | 106.72±7.37  | 101.37±6.78  |
|  | EHRQoL            | 174.24±14.93 | 223.42±16.12 | 218.51±15.76 |

|               |                   |              |              |              |
|---------------|-------------------|--------------|--------------|--------------|
| Control Group | subjective ComQol | 96.23±5.54   | 97.21±5.26   | 95.24±5.63   |
|               | objective ComQol  | 92.62±6.32   | 91.58±6.53   | 90.87±6.24   |
|               | EHRQoL            | 178.21±15.61 | 177.42±15.49 | 178.17±15.37 |

The values presented in Table 3 indicate that: 1) there was no significant difference between the two experimental groups and the two groups with the control group in terms of the mean quality of life quality in both types of quality of life questionnaire in the pre-test stage ( $P>0.05$ ). In other words, the small difference between the experimental and control groups in the pre-test is the result of a fortuity. 2) there is a significant difference between the experimental and control groups in terms of the mean of quality of life in each case of quality of life questionnaire in posttest stages ( $P>0.05$ ). In other words, the average variable quality of life in post-test between the experimental groups (FEWDS Group and Tele-Exercise Group) was significantly higher than the control group, respectively. 3) The mean of quality of life in both quality of life questionnaires between experimental groups at follow-up was significantly higher than the control group ( $P>0.05$ ). Diagram 1 shows the quality of life changes in the triple stages.

**Table 3.** Comparative results of quality of life in different stages and by group

| Groups                   | Pre-Test          |                  |        | Post-Test         |                  |        | Follow-up         |                  |        |
|--------------------------|-------------------|------------------|--------|-------------------|------------------|--------|-------------------|------------------|--------|
|                          | subjective ComQol | objective ComQol | EHRQoL | subjective ComQol | objective ComQol | EHRQoL | subjective ComQol | objective ComQol | EHRQoL |
| FEWDS VS Tele-Exercise   | 0.168             | 0.191            | 0.543  | 0.610             | 0.585            | 0.823  | 0.602             | 0.563            | 0.811  |
| FEWDS VS Control         | 0.251             | 0.232            | 0.432  | 0.001             | 0.001            | 0.001  | 0.001             | 0.001            | 0.001  |
| Tele-Exercise VS control | 0.367             | 0.321            | 0.523  | 0.001             | 0.001            | 0.001  | 0.001             | 0.001            | 0.001  |

Diagram 1 Changes in the quality of life of each intervention group individually in triple steps

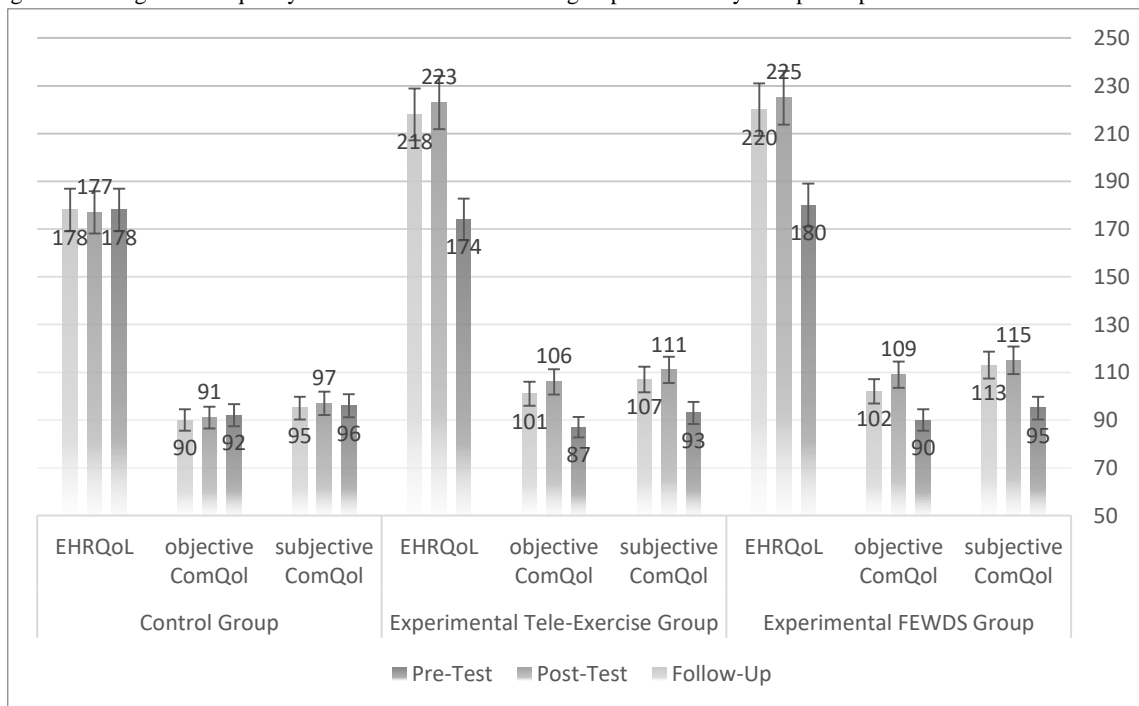


Diagram 1 shows the relative stability of quality of life in the triple stages in the control group. Also, the charts show the improvement in quality of life in both experimental groups (FEWDS and Tele-Exercise) at post-test and follow-up stages. Furthermore, the quality of life stability can be seen in both experimental groups at the follow-up stage, compared to the post-test.

## **Discussion**

According to the results of this study, exercise program Tele-Exercise as well as exercise program FEWDS, improves the quality of life of the elderly.

In a study by Phoemsaphawee and Leelayuwat in Thailand in 2017 conducted on the elderly, it has been shown that a low intensity exercise program has a significant impact on quality of life in both physical and Subjective health and mental health [24]. In addition, in a study conducted by Janyacharoen et al in 2016 on an elderly age group, it was shown that a training program was gradually refined, and a growing 8-week course could improve the quality of life of the elderly significantly [40], And in line with the results of this study. In another study done by Lord and Castell in 1994 in the United States, It has been shown that the progressive muscle program increases muscle strength, ability to maintain body balance and, ultimately, increase the various dimensions of quality of life [41]. In addition, various studies have shown that exercise and related exercises improve the quality of life of the elderly and other age groups in order to improve their physical functioning [42,43]. In a meta-analysis study that was conducted by Robertson and his colleagues in the years 2002-2004, It has been shown that exercise programs can have different effects on muscle strength, individual ability to do daily work without dependence and quality of life [44]. As far Papaioannou and colleagues, examined the effect of exercise to improve the quality of life of elderly woman at home have paid, And the results indicate an improvement in the quality of life in this age group [45].

In addition, due to the many problems that have been encountered in the elderly study, especially in the field of physical activity and exercise, it is suggested that extensive studies be carried out with more samples so that the results of other studies can be checked. In the present study show that getting regular exercise during eight weeks " FEWDS and Tele-Exercise Exercises" increases physical performance and improve the quality of people's lives, and this reflects the positive effect of exercise on the dimensions and physical performance quality of life for elderly.

Although many studies have examined the role of physical activity on the quality of life in elderly people with various illnesses, only a small number of these studies examine the effects of exercise on the quality of life of elderly people without any specific disease, and in particular home-based exercises [46,47]. Also, according to investigations conducted by the researcher, there has been no study to date on Remotely Exercise (Tele-Exercise) and the improvement of quality of life. But it due to financial and time savings in costs, reduce risks due to not transmit the home, locating in virtual groups Interactive, feel useful and create more incentives due to the use of technology [33-35], the exercise pattern Tele-Exercise can be a good alternative to FEWDS for this age group and in other types of age groups with different physical conditions.

Increasing quality of life although one of the primary goals of health promotion in the elderly, there are still some doubts as to whether progress in physical ability and increased muscle strength increases other aspects of quality of life, and in this study we also looked at this issue. In the present study, it has been shown that regular exercise programs increase the person's ability to do daily tasks without being dependent on others and has a positive effect on other aspects of quality of life. As a result of the implementation of the sports FEWDS and Tele-Exercise, which increased physical activity and increased individual autonomy in daily work, we could increase the quality of life dimensions such as improving one's performance, reducing physical pain, general health, vitality and well-being, social functioning, emotional functioning and mental health in the elderly and improve the quality of life in them, While those who did not practice exercise did not change their quality of life.

## **Conclusion**

By using a regular and continuous exercise program in both methods "FEWDS and Tele-Exercise", various aspects of quality of life, especially physical and health characteristics, can be increased in individuals, and the older person is more independent in daily work And helped the process of successful Elderly and pave the way for improving the quality of life in the elderly, in order to make use of the valuable experiences of the elderly in order to promote society in various dimensions. Also, a Tele-exercise training program can be a good alternative to a FEWDS.

It is hoped that this research will pave the way for scholars and students to research and further improve the living conditions of the elderly, and will lead to an increase in efforts by community health authorities to improve the welfare and well-being of these loved ones, It also helps health care providers provide health promotion programs to facilitate a healthy and active life for the elderly, and ultimately help them achieve the highest levels of health and quality of life, With the wish that the elderly of our community can experience the aging of sweets.

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