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The online version of this article can be found at
http://ebcj.mums.ac.ir/article_9311.html

Evidence Based Care Journal 2017 07:07 originally published online 01 October 2017
DOI: 10.22038/EBCJ.2017.25876.1584

Online ISSN: 2008-370X

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Evidence Based Care Journal

Original Article

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Effect of Resistance Training using Thera-Band on Muscular Strength and Quality of Life among the Elderly

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Received: 26/06/2017
Accepted: 07/09/2017

Evidence Based Care Journal, 7 (3): 7-16

Abstract

Background: Lack of mobility and motor impairments can intensify mental health problems in the elderly. Muscle weakness is one of the most important cause of fall in the old individuals. Muscular performance is regarded as one of the significant components of quality of life in older adults.

Aim: This study aimed to investigate the effect of resistance training using Thera-Band on muscular strength and quality of life among the elderly in Mashhad, Iran.

Method: This randomized clinical trial was conducted on 70 elderly people referring to the health centers of Mashhad in 2016. The participants were randomly assigned into two groups of intervention and control. The intervention group was subjected to lower- and upper-extremity resistance training with Thera-Band performed two thirty-minute sessions a week for six weeks. However, the control group did not receive any training. Data collection was performed using a dynamometer and the short version of the World Health Organization Quality of Life. The data were analyzed in SPSS version 16 using independent t-test, Mann-Whitney U test, paired t-test, Chi-square test, and exact Chi-square.

Results: The mean ages of the individuals in the intervention and control groups were 69.7±6.1 and 77.2±6.2 years, respectively. After intervention, the mean scores of quality of life ($P<0.001$) and muscular strength in the upper and lower extremities ($P<0.001$) were significantly higher in the intervention group than those in the control group.

Implications for Practice: Resistance training with Thera-Band could enhance muscular strength and improve quality of life in the elderly. It was concluded that the promotion of this exercise program could have a positive effect on the muscular strength and quality of life among this population.

Keywords: Elderly individual, Muscular strength, Quality of life, Resistance training, Thera-Band

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Introduction

The phenomenon of aging population is considered as one of the glories and challenges of human beings (1). According to the report released by the United Nations, the total population of the elderly in the world was about 740 million people in 2009, which would reach to 2 billion people by 2050 (2). As a result, the proportion of the elderly in Iran will also rise in a way that it is expected that the geriatric population would be 25 million individuals by 2050 (1).

Moreover, muscular performance in the old people has been accepted as the most important physical health index in the world, and it is also considered as one of the key components of quality of life. Muscular performance includes muscular strength, flexibility, balance, agility, and aerobic endurance. Among other factors, muscular strength is considered as the most significant component, which is reduced by aging (3). Decreased muscular strength, and subsequently muscular performance can bring about various problems and complications, such as increased risk of chronic diseases, intensified risk of falls, loneliness and isolation, depression, lack of independence, and ultimately reduced quality of life (4).

In this respect, only 5% of the total number of falls causes serious damage, which can have physical (e.g., pelvic fracture, disability, lack of physical ability, and death) and mental effects (e.g., lost self-confidence and lowered life expectancy). The mental effects can also lead to motor deficits, reduced performance, and decreased quality of life (5-8). Today, quality of life in different age groups, especially the elderly, has drawn the attention of numerous researchers and politicians (9). Accordingly, one of the important and primary goals of the World Health Organization (WHO) in 2010 was to enhance the quality of life (10). In the meantime, due to the rapid increase in the geriatric population and aging, quality of life has been of special attention (11).

In this regard, studies have shown that sports and physical activities are considered as one of the preventive methods affecting treatments of problems caused by aging. Warburton (2006) also believed that one of the methods aiding sense of well-being and quality of life is the use of sports and physical activities (12). Moreover, Aemi (2015) showed that resistance training via Thera-Band could affect the promotion of health in the elderly women, reduce sarcopenia, and improve health-related quality, cardiovascular functioning, and metabolic syndrome indicators (13).

Moreover, lowered risk of chronic diseases, enhanced chronic disease management, and improved ability for independent performance can be mentioned among the benefits of exercise for the elderly.

Therefore, the selection and development of appropriate training programs targeted toward the reduction of health-related problems, prevention of diseases, promotion of health, and decrease of care resources over time for older adults are of utmost importance (14, 15). The review of the related literature also showed that appropriate sports activities specific to the elderly have led to an increase in muscular strength as a basis for motor functioning, and ultimately prevention and reduction of relevant complications. Consequently, it is necessary to design, investigate, and implement interventions improving muscular strength in the elderly and enhance their ability to perform daily activities resulting in reinforced performance capacity (16).

One of the appropriate exercises recommended to older adults is strength training, which is also called resistance training. These exercises have become one of the most well-known forms of training to augment the capacity of muscle contraction in adults, elderly individuals, as well as athletes (14). The typical training methods include the use of exercises and physical activities, such as resistance training, Tai Chi, yoga, and balance, as well as the utilization of Thera-Band as a suitable alternative for such activities (14, 17).

Given that weakened motor and cognitive functioning is considered as one of the consequences of senility, the employment of designed exercise programs, such as the use of elastic bands (Thera-Band), can prevent this process, and also defer it. The Thera-Band made from elastic materials is offered in form of a band, which can be used for strenuous exercises tailored to the levels of functioning in the elderly. These bands have been designed in different colors indicating resistance levels. As an example, the yellow and red bands show lower and higher resistance, respectively (18).

The results of different studies in other age groups have suggested that resistance exercises and training using Thera-Band can have positive effects on flexibility, mobility, quality of sleep, daily activities, ability to stand and walk, reduced knee pain, metabolic parameters, and body fat (14, 17). In these investigations, the use of elastic bands in the design of elderly exercise programs to reduce the possibility of damage to these individuals, increase body functioning, and improve fitness has

been of utmost importance (19). However, few studies have been carried out on the impacts of such exercises on muscular strength and quality of life among the elderly people.
The American College of Sport Medicine also considered and recommended the importance of resistance training on the quality of life and physical functioning among the old people based on the results of numerous investigations indicating the benefits of such exercises for the elderly (14, 20). Some other studies have also suggested the positive effects of implementing different programs on the improvement of motor functioning, balance, and lower-extremity strength in the elderly (21).
Furthermore, the review of the related literature in Iran demonstrated that only a limited number of performance factors or motor functioning indicators, such as speed, flexibility, and agility along with fear of falls and avoidance of fall-related activities, improved reaction time, and balance, have been investigated in this regard (16). Moreover, there are limited studies investigating the effects of using resistance training via Thera-Band on muscular strength as the most important indicator of muscle-motor functioning in the elderly by means of a dynamometer.
Attention to physical functioning, improved quality of life, and successful completion of old age are among the current healthcare priorities in all countries, especially Iran. The design of an affordable, comprehensive, easy, and safe care program is taken into account as one of the care priorities in this vulnerable group in the domain of geriatric nursing duties. Furthermore, the programs and interventions, which are feasible to perform at home, can have their own positive effects on quality of life, independence, functioning, and finally health promotion among the Iranian elderly. With this background in mind, the present study aimed to investigate the effect of resistance training on muscular strength and quality of life among the elderly.

Methods

This randomized clinical trial was conducted on 70 elderly individuals referring to Bafti and Adviehchi community health centers (in districts 5 and 1, respectively) in Mashhad, Iran, in 2016 using a pretest-posttest design. After obtaining written informed consent from the participants, they were assigned into two groups of intervention and control through random allocation method. Accordingly, separate drawing was conducted for each elderly individual referring to each health center in a way that sampling was equally performed for each group. The minimum sample size was also calculated using the formula of "comparison of two independent groups". To obtain the mean for muscular strength and quality of life, a pilot study was conducted on 20 elderly people (i.e., 10 individuals in each group). In this respect, the sample sizes for muscular strength and quality of life were 26 and 19 individuals, respectively. Finally, the highest sample size associated with muscular strength was used as the criterion for this study. Therefore, the sample size with a confidence level of 95% and a test power of 80% was estimated as 26 cases. However, 35 individuals were studied in each group considering the sample loss. Moreover, no individual was excluded from the study.
The inclusion criteria were: 1) age of $\geq$ 65 years, 2) lack of acute physical problems (e.g., cardiovascular and respiratory disease), 3) no osteoporosis (based on self-reports and records available in health centers), and 4) visual acuity of seeing hand fingers at a distance of 6 meters. On the other hand, the exclusion criteria entailed: 1) infliction with acute muscle or osseous problems during the study, 2) absence for more than two sessions, and 3) withdrawal or unwillingness to continue to participate in the study for any reasons.
The research instruments included demographic form, physical activity readiness questionnaire, short version of the 26-item WHO Quality of Life Questionnaire (WHOQOL-BREF), as well as a dynamometer. The demographic information form was comprised of 11 multiple-choice items enquiring about age, gender, education, occupation, marital status, height, weight, body mass index, calories received for three days, living status, and history of cardiovascular diseases. The physical activity readiness questionnaire consists of seven yes-no questions used to examine the elderly in terms of problems, such as cardiovascular diseases, antihypertensive drug consumption, and loss of consciousness. The score range in this instrument is within 0-7, and a high score represents more readiness to perform physical activities.
The WHOQOL-BREF entails the subscales of physical health (with total score of 18 and score range of 7-35), mental health (score range of 6-30), social relations (with score range of 3-15), and environmental health (with total score of 18 and score range of 8-40). After calculating the raw score for each subscale, it was converted into a standard score ranging within 0-100 (22). The content

validity of the WHOQOLQ-BREF was examined and confirmed by seven faculty members at the School of Nursing and Midwifery in Mashhad. Moreover, the reliability of this instrument was evaluated through internal consistency method, rendering a Cronbach's alpha coefficient of 0.91.

Dynamometer is one of the most important tools used in the domain of power transition measurement providing the capability of evaluating tension and compression. This tool can be also employed for testing static force with cables and training equipment or rehabilitation in difference sizes and ranges. The given tool was used in this study to measure muscular strength in the elderly.

The content validity of the demographic form and physical activity readiness questionnaire was also examined and confirmed by seven faculty members at the School of Nursing and Midwifery in Mashhad. A new, safe, and standard dynamometer (Pull Push, Danseh Salar Iranian Company, Iran) with a tension and compression marker was employed in the present study. The validity of this device was also approved. To assess the reliability of the dynamometer and physical activity readiness questionnaire, these research instruments were tested on 10 elderly people before and after resistance training using test-retest reliability method, rendering the reliability coefficients of 0.91 and 0.89, respectively.

Before the intervention, informed consent forms were filled out by the elderly. Subsequently, they were provided with the demographic form, physical activity readiness questionnaire, and WHOQOLQ. It should be noted that the researcher completed the instruments for the elderly who were illiterate or semi-literate. Afterwards, upper- and lower-extremity muscular strengths were measured via the dynamometer, the results of which were saved in the computer. Moreover, the individuals were informed about their muscular strength, and the samples were included in the study.

Resistance training using Thera-Band was performed with the presence of the researcher as an instructor, who had already been trained by sports medicine specialist, and therefore were competent in this regard. The exercises were completely explained to the participants in the intervention group in two sessions in order to help them gain skills in using Thera-Band and perform resistance training. Moreover, their questions about time and place, dress codes, training, and exercises were answered to prevent any damage or problems. The elderly people also received explanations about this issue that the exercises could be designed and regulated for a variety of populations with different levels of body functioning due to the characteristics of the Thera-Band.

The elastic band included the colors of yellow (thin), red (medium), green (heavy), blue (extra heavy), black (special heavy), silver (super heavy), and golden (max). According to the judgment of the sports medicine specialist and considering physiological reduction in muscular strength among the elderly, only three colors of Thera-Band, namely red (medium), green (heavy), and blue (extra heavy), were used during the exercises from lower to higher elasticity. The intervention group was divided into categories of 10 individuals in order to be well monitored and obtain better feedback with fewer people in each group.

The intervention was implemented two 30-minute sessions a week, lasted for six weeks. Based the judgment of the sports medicine specialist in Toos Nursing Home, an appropriate and indoor space was selected with the good cooperation of authorities. Prior to each session, the elderly individuals performed stretching exercises for 10 min to warm up, and then they went jogging for 10 min to cool down. Resistance training using Thera-Band included nine movements, which are illustrated in Table 1.

The main upper-extremity movements consisted of chest press, shoulder press, as well as front and back arm press for both arms in the elderly. If these individuals felt tired, 5 min of rest was considered; otherwise, they immediately performed the next movement. The main lower-extremity movements included leg press, twin press, front thigh press, back thigh press, and posterior leg press. After each session, the elderly were offered receptions. The control group did not perform any exercises or physical activities, and they were asked to continue their normal course of life and stick to their daily physical activities. At the end of the 6th week (i.e., immediately after the twelfth session), the quality of life was remeasured using the given questionnaire, and muscular strength (the left and right arms and legs) was retested in both intervention and control groups. The participants were also informed about these data.

The most important ethical considerations in this study included obtaining a special permission from the Ethics Committees of Mashhad University of Medical Sciences and earning a written informed consent complying with observation of 26 codes. Following data collection and coding, the data were analyzed in SPSS software version 16 using descriptive statistics, Kolmogorov-Smirnov test, t-test,

Table 1. Training protocol using Thera-Band for each session

Training using Thera-Band		Number of movements per session
Red Thera-Band	Session 1	10 upper- and lower-extremity movements
	Session 2	10 upper- and lower-extremity movements
	Session 3	15 upper- and lower-extremity movements
	Session 4	15 upper- and lower-extremity movements
Green Thera-Band	Session 5	10 upper- and lower-extremity movements
	Session 6	10 upper- and lower-extremity movements
	Session 7	10 upper- and lower-extremity movements
	Session 8	15 upper- and lower-extremity movements
	Session 9	15 upper- and lower-extremity movements
Blue Thera-Band	Session 10	10 upper- and lower-extremity movements
	Session 11	10 upper- and lower-extremity movements
	Session 12	15 upper- and lower-extremity movements

Mann-Whitney U test, paired t-test, Chi-square test, and exact Chi-square test.

Results

According to the results, the mean ages of the elderly in the intervention and control groups were 69.7±6.1 and 77.2±6.2 years, respectively. In terms of gender, 22 (69.2%) and 26 (74.3%) individuals in the intervention and control groups were female, respectively. Considering education, 12 (34.4%) and 24 (68.6) participants in the intervention and control groups were illiterate, respectively. Furthermore, 20 (58.8%) and 24 (68.8%) individuals in the intervention and control groups were housewife, respectively. Moreover, regarding the marital status, 26 (74.3%) and 23 (65.7%) subjects in the intervention and control groups were married, respectively. Other variables related to the demographic characteristics and physical activity readiness of the study participants and the results of their homogeneity in both groups are presented in Table 2.

Before the intervention, the mean muscular strength was measured in kilogram. These values were 15.2±4.1 and 13.9±3.0 for the right arms in the intervention and control groups, respectively. In

Table 2. Comparison of demographic characteristics of the study participants

Variable		Groups: Intervention standard deviation±mean	Groups: Control standard deviation±mean	P-value
Height (cm)		161.1±9.1	160.7±8.1	**0.83
Weight (kg)		69.6±9.5	65.7±8.7	**0.70
Body mass index (kg/m^2)		26.9±3.4	25.6±2.5	**0.30
Amount of calorie received during three days (KCal)		4698.1±3587.7	3982.3±1163.3	***0.38
Physical activity readiness		6.3±1.1	5.7±1.2	***0.10
Level of education	Primary school	(34.3) 12		***0.13
	Junior high school	(45.7) 16		
	High school diploma	(11.4) 4		
	Academic education	(8.6) 3		
Living status	Alone	(14.3) 5		*0.63
	With spouse	(28.6) 10		
	With children	(11.4) 4		
	With spouse and children	(45.7) 16		
Prior history of diseases	No diseases	19 (54.3)		*0.20
	Hypertension	4 (11.4)	7 (20.0)	
	High blood sugar, triglyceride, and cholesterol	4 (11.4)	3 (8.6)	
	High blood sugar, triglyceride, cholesterol, and blood pressure	7 (20.0)	12 (34.3)	
	Other cases	1 (2.9)	5 (14.3)	

*Chi-square, **independent samples t-test, ***Mann-Whitney U test, ****exact Chi-square

Table 3. Comparison of mean muscular strength in intervention and control groups before the first session and after the final session

Muscular strength	Stage	Group		P-value
		Intervention	Control	
		SD±Mean	SD±Mean	
Right arm	Before session 1	15.2±4.1	13.9±3.0	×0.14
	After session 12	18.7±4.8	13.8±3.0	×<0.001
	Within-group test	*P<0.001	*P=0.28	
Left arm	Before session 1	15.3±4.0	13.6±3.4	×0.07
	After session 12	18.6±4.9	13.7±3.1	×0.001
	Within-group test	*P<0.001	*P=0.85	
Right leg	Before session 1	14.5±4.2	13.2±2.7	×0.30
	After session 12	17.2±4.3	12.5±3.3	×0.001
	Within-group test	*P<0.001	*P=0.15	
Left leg	Before session 1	14.5±4.2	13.2±3.2	×0.23
	After session 12	17.5±4.4	13.1±2.9	×0.001
	Within-group test	*P<0.001	*P=0.72	

×Independent samples t-test, *paired t-test

addition, the mean values of muscular strength were 15.3±4.0 and 13.6±3.4 for the left arms in the intervention and the control groups, respectively. These values for the left legs in the intervention and control groups were 10.3±2.3 and 9.2±2.1, respectively. Additionally, the given values for the right legs were 10.8±2.2 and 9.3±1.2 in the intervention and control groups, respectively.

The results of the independent t-test revealed no statistically significant difference between the two groups considering the mean scores of muscular strength of the left and right arms as well as left and right legs at the pre-intervention stage (P>0.05). Furthermore, the paired t-test demonstrated that the intervention group showed a statistically significant difference in terms of the mean muscular strength of the right and left arms and legs (P<0.001) after the intervention. Nevertheless, such a difference was not significant in the control group (P>0.05) (Table 3).

Considering the dimensions of quality of life before the intervention, the mean scores of physical health in the intervention and control groups were 19.2±4.1 and 19.9±3.0, respectively (Table 4). The mean scores of mental health in the intervention and control groups were 16.1±2.0 and 16.8±3.4 (P>0.05),

Table 4. Comparison of mean quality of life in both intervention and control groups before the first session and after the final session

Quality of life	Stage	Group		P-value
		Intervention	Control	
		SD±Mean	SD±Mean	
Physical health	Before session 1	19.2±4.1	19.9±3.0	×0.30
	After session 12	22.4±1.7	19.3±2.4	×0.001
	Within-group test	*P<0.001	*P=0.56	
Mental health	Before session 1	16.1±2.0	16.8±3.4	×0.41
	After session 12	19.3±1.9	16.3±3.1	×0.001
	Within-group test	*P<0.001	*P=0.83	
Social relations	Before session 1	9.8±4.2	9.5±2.7	×0.53
	After session 12	12.4±1.6	9.5±1.8	×0.001
	Within-group test	*P<0.001	*P=0.82	
Environmental health	Before session 1	22.5±4.2	24.2±3.2	×0.14
	After session 12	28.8±3.3	14.5±4.1	×0.001
	Within-group test	*P<0.001	*P=0.73	
Total score of quality of life	Before session 1	80.2±1.3	82.6±5.0	×0.09
	After session 12	88.9±6.4	82.1±9.1	×0.001
	Within-group test	*P<0.001	*P=0.61	

×Independent t-test, *paired t-test

respectively. The mean scores of social relations were 9.8±4.2 and 9.5±2.7 in the intervention and

control groups, respectively (P>0.05). Moreover, the mean scores of environmental health in the intervention and control groups were 22.5±4.2 and 24.2±3.2, respectively (P>0.05) indicating no significant differences between the two groups in this regard prior to the intervention.

After twelve sessions of resistance training in the intervention group, the mean scores of quality of life dimensions regarding physical health, mental health, and social relations were 22.4±1.7, 19.3±1.9, and 12.4±1.9, respectively (P<0.001). Moreover, the mean scores of public health and total quality of life were 28.8±6.4 and 88.9±6.4 in the intervention group, respectively (P<0.001), which were significantly higher than those in the control group. The results of the paired t-test revealed a significant rise in all dimensions of physical health, mental health, social relations, environmental health, and the total score of quality of life in the intervention group (P<0.001) after the final session, compared with those in the first session. However, no significant difference was observed in the control group in all dimensions of quality of life at the post-intervention stage, compared with those at the pre-intervention stage (P<0.001) (Table 3).

Discussion

The results of this study showed that following the intervention, the mean scores of muscular strength in the left and right arms and legs as well as those of total quality of life and its dimensions (i.e., physical health, mental health, social relations, and environmental health) were significantly higher in the intervention group than those in the control group. In this study, the interventional training program was focused on resistance exercises using a dynamometer (as one of the most important tools in measuring power transmission, tension, and compression ability) to measure the muscular strength.

It should be noted that increased muscular strength is considered as the basis to improve physical/motor functioning. Physical activity can also decrease disabilities in the elderly and improve their independence and quality of life (23, 24). During senility, the main factors affecting muscular strength associated with increased age are muscular atrophy due to decreased muscle protein and lack of mobility, or both of them. The reduced size of the muscles can be the result of decline in total muscular fibers or increase in slow-twitch fibers and/or decrease in type-2 fast-twitch fibers.

One of the changes that is prevailing in the older adults is reduced muscle mass by 25-45% that is sometimes called geriatric sarcopenia. Sarcopenia is the consequence of normal aging and is not necessarily associated with a particular disease (24). In this respect, resistance training using Thera-Band (e.g., crawl arm and arm pull-down) can limit blood flow, significantly increase muscle area (e.g., knee opening and bending), and also help reach the maximum muscular strength. Therefore, improved muscular strength and physical health can result in the enhancement of independence in terms of carrying out daily activities followed by improved quality of life in older people (25, 26).

Furthermore, this training program does not make changes in hemodynamic parameters (e.g., heart rate and blood pressure), vascular endothelial functioning, and coagulation factors. It also does not lead to hardening of the arteries and injury to muscle building (26). Consequently, it seems that the changes occurring following the resistance training can be often attributed to increased muscular strength in the elderly participants that is caused by the involvement and reinforcement of the physiological systems.

In this regard, Delshad et al. (2010) investigated the effect of resistance training on the prevention of sarcopenia in the elderly women. They demonstrated that resistance training could help improve muscle functioning as well as increase strength and endurance in the elderly individuals in the intervention group (27). The results of the mentioned study were consistent with those of the present study in terms of the positive impact of exercise on muscle strength.

It should be noted that sports and physical activities are among the preventive methods affecting the treatments of problems associated with old age. They can also result in compensation for the loss of muscle mass and strength, increased bone health, improved balance, enhanced flexibility, elevated life expectancy, preserved mental health, and augmented self-confidence in the elderly (19).

Studies have revealed that fun physical activities can reduce the risk of falling and increase balance in older people. Moreover, it has been noted that physical activities can reduce geriatric pains if they are based on humor and laughter. Since pain is considered as an important component of quality of life in the elderly (28, 29), it can be concluded that fun physical activities along with laughter have positive effects on the quality of life among this population.

In addition, physical activities can lower motor/functioning restrictions in the old people. These

positive impacts can encourage the elderly to continue sports and exercises, especially when attractive sports, such as training via elastic bands of Thera-Band, are implemented. The use of bands with different resistance embolden the elderly to continue training and overcome the resistance of stronger band. Therefore, a cycle is established, which can have numerous positive effects on muscular strength as well as physical and mental health in this age group (26).

In a review study conducted by Aemi et al. (2015), the use of elastic band in a training program had effects on the promotion of the health status of the women aged ≥ 60 years, and it could increase their quality of life (13). Therefore, the results of the given review were consistent with the findings of the present study.

In a study carried out by Deo Leo (1999), it was reported that exercise did not have significant impacts on the quality of life (30). Inconsistent with the mentioned study, the present study revealed that physical activities had a significant effect on the improvement of the quality of life and all its dimensions. One of the reasons for the discrepancy between the findings of these two investigations is the difference in the duration of the interventions and the instruments used in these studies because mental concepts and basic indicators, such as quality of life, can be measured more accurately with the passage of time and advancement of science.

It should be also noted that Deo Leo used the Lipid's Quality of Life Questionnaire, whereas in the present study, we employed the WHOQOLQ-BREF. Regarding this, it is normal to obtain inconsistent results given the difference in items, scoring methods, and score ranges of these questionnaires. Considering increased muscular strength as well as the relationship of boosted muscle mass and strength with brain functioning and fatigue in these individuals, the results obtained by De Leo could be justifiable.

Since the results of the current study demonstrated that resistance training programs by Thera-Band could lead to improved muscular strength and enhanced quality of life in the elderly. In addition to types of exercises and the design of the bands with various resistance levels and different colors based on performance levels specific to each elderly individual as well as the resulting attractiveness and vitality. It is hoped that the given results can help the geriatric community to improve their quality of life and benefit from successful aging.

One of the limitations of this study was the lack of measuring the size and thickness of the muscles in the elderly, which was not possible due to the limitations in funding and time. Moreover, the study samples were only selected from the elderly referring to the health centers and the results had restrictions in terms of generalizability.

Implications for Practice

The results of this study revealed that resistance training by means of Thera-Band could have positive effects on muscular strength among the elderly. This intervention could also improve quality of life among this group as an intervention in the domain of geriatric nursing. Therefore, it is recommended to apply this training program in the health centers and nursing homes since it requires little equipment and training and is easy to practice anywhere, even at home. Moreover, it is suggested to conduct further studies on the elderly living in the nursing homes, and also measure the size and thickness of the muscles in this population in order to obtain a better evaluation of their strength.

Acknowledgments

This study was derived from a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Geriatric Nursing approved by the Ethics Committee of Mashhad University of Medical Sciences with the code of 941653 and the code of IRCT2017031227741N2 in the Iranian Registry of Clinical Trials. We hereby express our gratitude to the Research Deputy of this university for their financial supports. Moreover, we appreciate the officials of the Health Centers of districts 2 and 3, especially Adviehchi and Bafti Community Health Centers in Mashhad, the respected authorities and personnel of Toos Nursing Home, and all the honorable elderly individuals, who helped us in performing this study.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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