

# **EFFECT OF SURYANAMASKAR ON FUNCTIONAL MOBILITY, FUNCTIONAL REACH AND TRUNK FLEXIBILITY OF ELDERLY MEN**

Dr.VinuBhaskar

Assistant Professor of Physical Education

Govt T.D.Medical College Alappuzha.

## **ABSTRACT**

Later adulthood or the period of old age begins at the age of sixty. During this stage most individuals lose their jobs because they retire from active service. They begin to fear about their physical and psychological health. In our society, the elderly are typically perceived as not so active, deteriorating intellectually, narrow-minded and attaching significance to religion. Many of the old people lose their spouses and suffer from emotional insecurity. However, this may not be true of everybody. Many people at the age of sixty or above remain very healthy and active in life. The life style including exercise, diet and regular health check up helps people to enjoy meaningful and active life. Health is a strong predictor of well-being in late adulthood. When people face illness or chronic disabilities, they feel a loss of personal control. Not only does helplessness increase, but social isolation increases too. Research in India on yogic practices and geriatric

population were limited. Hence to have a better understanding of Suryanamaskar and its contribution towards to geriatric population, the scholar will make an attempt to determine the effect of twelve weeks of Suryanamaskar on Functional Mobility, Functional Reach and Trunk Flexibility of elderly men. The following test items were used to measure the selected variables under the study:

Timed Up and Go (TUG) test was used to determine functional mobility. The time in one tenth of a second required to complete the task was recorded.

Functional Reach (FR) test was administered to measure Functional Reach. The forward reach in to the nearest centimetre was recorded.

Sit and Reach (SR) test was used to determine the trunk flexibility. The distance covered to the nearest centimetre was recorded.

To determine the effect of twelve weeks of Suryanamaskar on Functional Reach, flexibility and functional mobility of elderly men, t-test was employed by using SPSS version 17. The level of significance was set at 0.05 level of confidence. After 12 weeks, Suryanamaskar group showed a significant improvement in all the selected variables under the study. It is concluded that Suryanamaskar elicited a positive improvement in the Functional Reach, flexibility and functional mobility of the elderly men.

**Key words:** Suryanamaskar, Functional Mobility, Functional Reach Trunk Flexibility & Elderly

## **INTRODUCTION**

Ageing is the process or group of processes occurring in living organisms that with the passage of time leads to a loss of adaptability, functional impairment and eventually to death. Human ageing process involves multidimensional changes on physical, psychological, cultural and social levels. The ageing process occurs in all living organisms, although it is most pronounced in vertebrate animals, animals having a cartilaginous and bony endoskeleton, an efficient heart and highly developed nervous system. Ageing process represents universal changes with age with in a species or population that are independent of disease or environmental influence. People age in different ways. Some reach old age with prestige, affluence and comfort; others face age wrought with hardships and difficult circumstances. The more unfortunate faces poor health, declining mental function, inadequate financial resources and loss of loved ones. Health habits are clearly identified as having a major influence on life expectancy and quality of life during old age. The healthy life style followers are only half as likely to have suffered disabilities that keep them away from work or lead to limited day-to-day activities. In other words, habitual healthy living appears not only to promote longevity but

also to increase the chance of having physical ability to enjoy life fully in later years. (Grabiner, M. 1995)

Ageing is associated with visible and sometimes dramatic changes in the body. Indeed, the relentless decline of the body is perhaps the most routinely used marker of chronological age. In old age, all body systems show decrements in physiological reserves. Degenerative process starts in this age and complications and sequel of chronic long-term disease such as hypertension and diabetes make their appearance. Some of the most observable physiological changes associated with ageing are a decline in maximal exercise capacity and maximum heart rate, an increase in systolic blood pressure and deterioration in glucose and lipid metabolism. The age associated changes in musculoskeletal system are a decrease in muscle strength and mass and as a result an increase in body fat. Ageing is associated with profound changes in body composition, muscle strength, Functional Reach, Trunk Flexibility and functional mobility and muscle mass often resulting in reduced functional capacity, physical frailty and impaired mobility.

Functional Mobility is a person's ability to interact with their environment effectively. This includes being able to walk around the house, do daily tasks, bath/shower, eat/feed, and drive or any other functional task. The functional mobility required by an individual is dependent on the functional that he needs to perform. (Penderson2003)

Functional Reach is the ability to maintain the body position over its base of support, whether that base is stationary or moving. Controlling postural sway during quiet standing is called static Functional Reach. Using pertinent internal and external information to react to perturbations of stability and activating muscles to work in coordination to anticipate changes in Functional Reach are called dynamic Functional Reach. It may be defined as the ease in maintaining or controlling body positions. (Liang, M. T.1998)

Flexibility is the ability of an individual to move the body and its parts through as wide range of motion as possible without undue strain to the articulation and muscle attachments. It can be defined as the ability to execute movements with greater amplitude or range. (A. J. Micheal 1996)

Exercise is frequently recommended as a part of a comprehensive programme of prevention, treatment or rehabilitation of chronic degenerative diseases. There is a pronounced plasticity and adaptability in the structural and functional properties of cells, tissues and organ systems in the human body when exposed when exposed to various stimuli. The benefits of physical activity and physical fitness have been long suspected but documented only recently. It now appears that regular participation over the course of a lifetime in moderate physical activity is protective against all cause of mortality and cardiovascular diseases. One form of such activity could be Suryanamaskar. Research in India on Suryanamaskar and

geriatric population were limited. Hence to have a better understanding of Suryanamaskar and its contribution towards the geriatric population, the present study made an attempt to determine the effect of twelve weeks of Suryanamaskar on Functional Mobility, Functional Reach and Trunk Flexibility of Elderly Men.

### **Variables under study:**

The variables found appropriate for the elderly men are:

1. Functional Mobility
2. Functional Reach
3. Trunk Flexibility

## **METHODOLOGY**

### **Participants:**

Sixty elderly men from Thiruvananthapuram, Kerala were selected as subjects for the study. The age of the subjects ranged from 60 to 65 years. Those individuals who were undergoing any sort of training programmes were not included in the study. Prior to the pre-test, a meeting of all the selected subjects were held and they were explained regarding the objectives of the study, test procedures and training schedules so that they had a clear concept regarding the workload and effort they had to put in. They were requested to cooperate and participate

actively throughout the programme. The medical screening of the subjects was carried out to ensure that the subjects were medically fit to undergo the type of training programme they were subjected to. The subjects were randomly assigned to an experimental group (N=30) and a control group (N=30).

### **Tools:**

*1. Timed Up and Go (TUG) test was used to determine functional mobility.*

Equipment required: standard chair, measuring tape and stop watch

Procedure: The subject was asked to sit on the standard armchair (seat height 46cm and arm height approximately 65 cms) with back against the chair and arms resting on the chair's arms. On the command 'go' he got up and walked at a comfortable and safe pace to the line marked on the floor three meters away, turned, returned to the chair and sat down again.

Scoring: The time taken to complete the task was recorded to the nearest one tenth of a second.

*1. Functional Reach (FR) test was administered to measure Functional Reach.*

Equipment required: Measuring stick marked starting portion and smooth wall surface.

### Procedure:

The subject was asked to stand beside the wall with his dominant side against the wall so that the scholar was at the 'zero' centimetre mark of the measuring stick, which was placed level against the wall at the height of the subject's acromion. The subject was asked to raise the arm closest to the wall to a normal reaching position (Measurement No.1). The subject was then directed to extend the arm as far as possible while maintaining his Functional Reach and measurement was taken (Measurement No.2). The functional reach measurement was then calculated by subtracting the normal reach from the maximal reach. (ie, Measurement No. 2 – Measurement No.1)

Scoring: The distance covered to the nearest centimetre was observed.

*1.Sit and Reach (SR) test was used to determine the Trunk Flexibility.*

Equipment required: A special apparatus consisting of a box with a measuring scale extending over the front edge, the 23<sup>rd</sup> centimetre coinciding with the edge. The apparatus was placed against a wall to prevent it from sliding on the floor.

### Procedure:

The subjects were asked to assume a long-sitting position in bare feet, with the feet against the box. They were asked to keep the knees straight and extend the arms



forward. Keeping one hand on the top of the other, palms facing down and finger pads on the top of the fingernails. If they could not keep the knees straight, the investigator held them down. They were told to reach directly forward along the measuring scale four times, holding the final position of maximum reach for at least one full second. Only one trial was given.

Scoring: The distance covered to the nearest centimetre was observed.

## **PROCEDURE**

Random group design was be used in this study. The subjects numbering sixty elderly men were divided into an experimental group (N=30) and a control group (N=30). The subjects will be selected at random by drawing lots and assignment of treatment was also at random. The necessary data will be collected by administering the tests for the chosen variables prior to the training and 12th week of the training period. Before the administration of the tests, the subjects will be briefed on the objectives and requirements of the various variables that are to be tested.

The experimental group will be given the Suryanamaskar for a period of 12 weeks. The experimental group was given a brief introduction of the procedure. The researcher demonstrated and explained the 12 steps of the Suryanamaskar. The subjects were asked to perform the Suryanamaskar in the morning for six days in a

week for a period of twelve weeks. The total time of practice was 60minutes. The intensity was bi-weekly increased by increasing number of rounds of Suryanamaskar. Two weeks of adaptations period was also given. The progressive biweekly programme followed by the subjects is given in table -1. The control group did not involve in any similar form of training. Post test was conducted after the conclusion of the training period and the data pertaining to selected variables such as Functional Mobility, Functional Reach and Trunk Flexibility were collected.

In the initial stages of the training period, the Suryanamaskar will be practiced according to the age and physical capacities of the subjects.

### **Statistical Analysis of the data:**

To determine the effect of twelve weeks of selected Suryanamaskar on Functional Mobility, Functional Reach and Trunk Flexibility of elderly men; 't' test was applied by using SPSS version 17. The level of significance was set at 0.05 level of confidence.

Table 1

### **Biweekly Schedule of Suryanamaskar**

Week	Number of Rounds of Suryanamaskar Performed	Recovery Time given in between the Rounds
1 and 2	1-6 rounds	Complete Recovery in Shavasana
3 and 4	6-12 rounds	Complete Recovery in Shavasana
5 and 6	12-18 rounds	Complete Recovery in Shavasana
7 and 8	18-24 rounds	Complete Recovery in Shavasana
9 and 10	24-30 rounds	Complete Recovery in Shavasana
11 and 12	30-36 rounds	Complete Recovery in Shavasana

## RESULTS

The data pertaining to selected variables such as Functional Reach, functional mobility and Trunk Flexibility were analyzed by paired t- test and the level of

significance was set up at 0.05 level of confidence. To find out the significant mean differences between initial and final scores for experimental group and control group ‘t’ test was administered. The mean and standard deviation scores of the experimental and control groups in the selected variables under the study and the corresponding ‘t’ values are given in Table 1.

**Table 1**

**Difference in Means of the Experimental Group and the Control Group in Functional Mobility, Functional Reach and Trunk Flexibility**

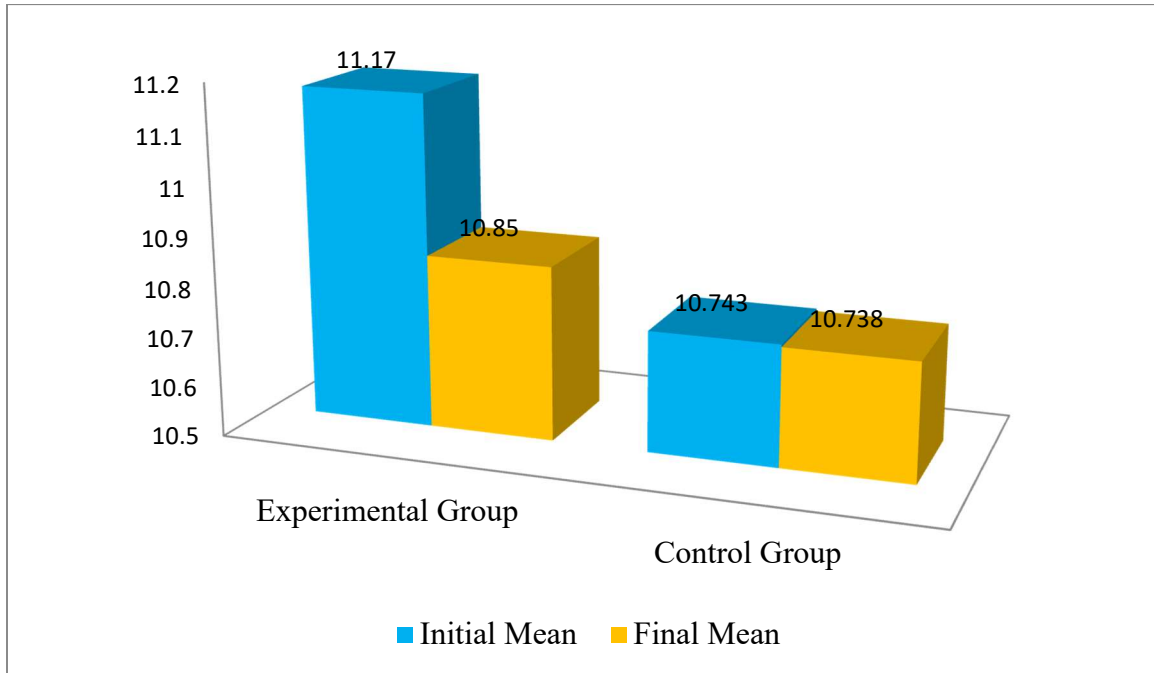
Variables	Group	No	Initial Mean	Final Mean	SD	Mean Difference	S.E	‘t’ Value
Functional Mobility	EXP	30	11.17	10.85	0.243	0.22	0.443	7.26*
	CON	30	10.743	10.738	0.005	0.044	0.008	0.619
Functional Reach	EXP	30	36.03	37.97	0.74	1.93	0.135	14.32*
	CON	30	34.33	34.45	0.31	0.117	0.057	2.040
Trunk Flexibility	EXP	30	23.01	24.45	0.568	1.43	0.568	13.81*
	CON	30	20.55	20.52	0.32	0.033	0.058	0.57

\* Significant at the 0.05 level. ‘t’ value with 29df =2.045

Mean difference of the experimental and control group for each variable are presented in figures 1, 2 & 3.

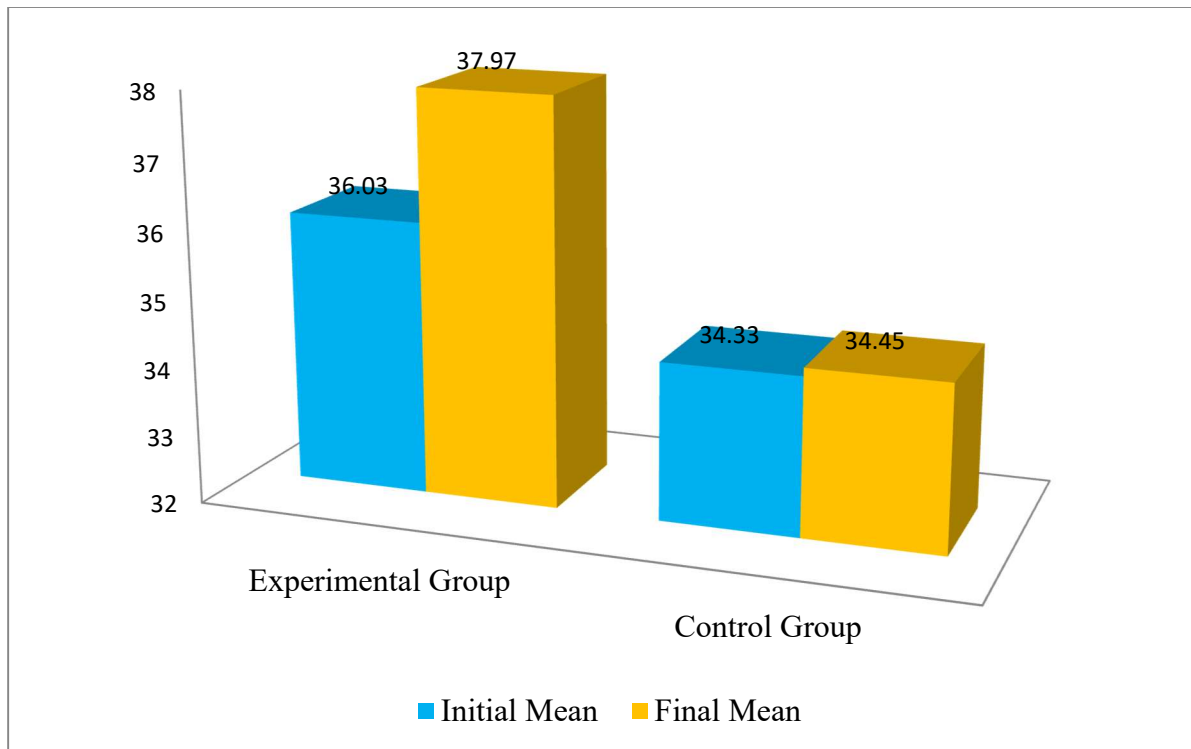
**Figure 1**

**Mean Difference in Functional Mobility for Experimental and Control Groups (Means in Seconds)**



**Figure 2**

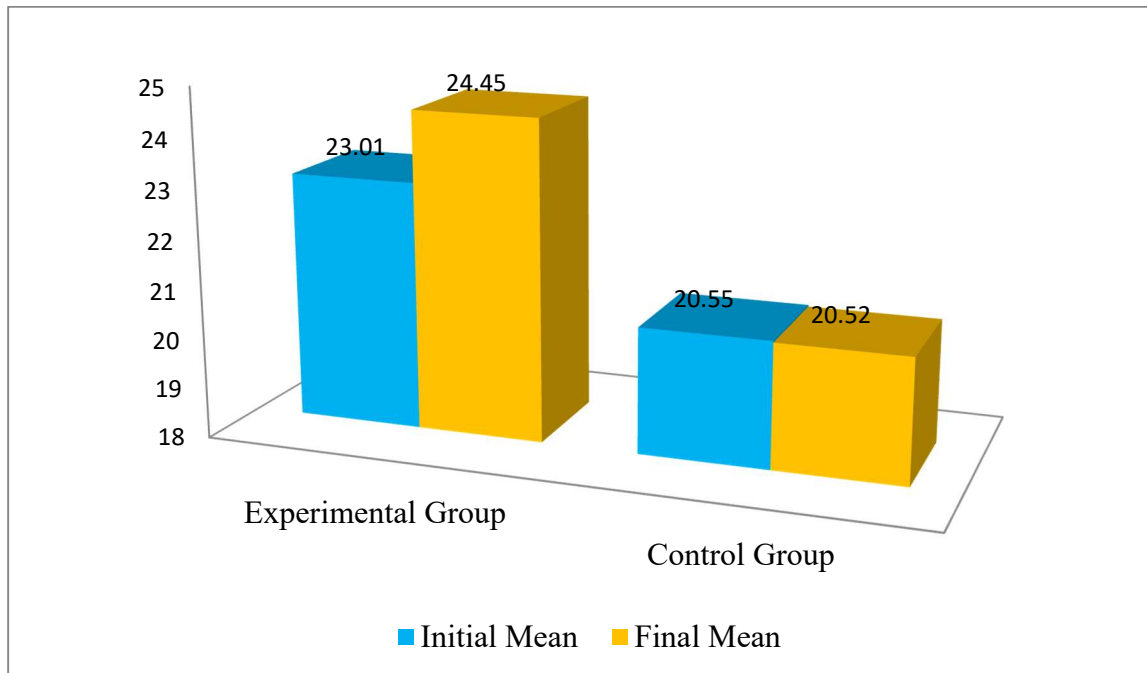
**Mean Difference in Functional Reach for Experimental and Control Groups (Means in cm)**



**Figure 3**

**Mean Difference in Trunk Flexibility for Experimental and Control Groups**

**(Means in cm)**



## DISCUSSION

The results of the study reveal that in the case of the experimental group, all the variables such as Functional Mobility, Functional Reach and Trunk Flexibility improved as a result of the 12weeks training of Suryanamaskar. In the case of the control group, no changes were noticed in any of the selected variables during the same period.

Functional Mobility of the experimental group improved after the training programme. Factors contributing to the improvement of Functional Mobility are the flexibility of the hip joint and the strength of back, leg and

abdominal muscles. The twelve Stages of the Suryanamaskar might have contributed to the improvement of the strength and flexibility of the back muscles, the flexibility of the hip joint and the improvement of the strength of the leg muscles.

Improvement was seen in Functional Reach in the experimental group following 12 weeks of Suryanamaskar. The Suryanamaskar might have provided daily challenges and practice opportunities for Functional Reach mechanisms. The practice of Suryanamaskar also increased the self-confidence of the elderly people in their abilities, in turn enhancing mobility.

An improvement was seen in Trunk Flexibility in the case of experimental group after 12 weeks of Suryanamaskar training. Stretch-ability, elasticity, mobility and suppleness are the essential components of flexibility. Stretch-ability and elasticity are the special qualities of the muscles and ligaments by which these can be stretched and can regain their normal length without any adverse effects on the concerned tissue. The Suryanamaskar consists of 12 positions that move the spine in various ways and promote flexibility of the limbs and improved the strength of abdominal muscles.

The twelve Stages of the Suryanamaskar may be attributed to the improvement in the stretch-ability and elasticity of the muscles and



ligaments around the hip joint. Suppleness is the ability of a muscle to remain in a state of low tension there by allowing for smooth and easy movements of limbs. Mobility pertains to the degree of movements possible in different planes at a joint. The 12 positions of the Suryanamaskar might have helped to improve the suppleness and mobility of the spine and back muscles.

## REFERENCES

1. Alan, Murray (1986) *Return to Fitness*. London: Bats Ford Ltd.
2. Alter, J. Micheal (1996) *Science of Trunk Flexibility* (2<sup>nd</sup> Edn.) Champaign: Human Kinetics Publishers
3. Brandon, L.J.(2003) Effects of Long-Term Resistive Training on Mobility and Strength in Older Adults with Diabetes. *Journal of Gerontology*, Vol.58:740-745.
4. Brenda, W.J. Penninx, et al. (2001) Physical Exercise and the Prevention of Disability in Activities of Daily Living in Older Persons with Osteoarthritis. *Archives of International Medicine*, Vol. 161:2309-2316.
5. Bud, Getchell (1992) *Physical Fitness: A Way of Life* (4<sup>th</sup> Edn.) NewYork: Macmillan Publishing Company

6. Edward, T. Howley and Scott, K. Powers (2000) *Exercise Physiology: Theory and Application to Fitness Performance* ( 3<sup>rd</sup> Edn.) Boston : McGraw Hill Company.
7. Fatouros, I. G.; et al. (2002) The Effects of Strength Training, Cardiovascular Training and their Combination on Trunk Flexibility of Inactive Older Adults. *International Journal of Sports Medicine*, Vol.23; 112-119.
8. Grabiner, M. (1995) Changes in Movement Capabilities with Ageing. *Exercise Sports Science Review*, Vol.23:65-104.
9. Hirrbold, C.L. (1986) The Effects of a Six Week Structured Stretching Programme on Trunk Flexibility and Body Image in Older Adults aged 65-95 Years. *Completed Research in Health, Physical Education and Recreation*, Vol.4:83.
10. Huber, M. S. (1986) The Effects of a Six week Structured Stretching Programme on Trunk Flexibility and Self-Esteem in 65-95 year Olds. *Completed Research in Health, Physical Education and Recreation*, Vol. 4:66.
11. Iyengar, B.K.S. (2004) *Light on Yoga*.(3<sup>rd</sup> Edn.) New Delhi; Harper Collins Publishers.

12. John Gent (1986) *Health and Happiness through Yoga*. Bombay: D.B. Tharapore Vala Sons and Co. Pvt. Ltd.
13. Lexell, J. (1990) The Structure and function of the ageing human muscle. *Journal of Gerontology*, Vol.45:125-128.
14. Liang, M.T. et al. (1998) Functional Reach and Strength of Elderly Chinese Men and Women. *Nutrition, Health and Ageing*, Vol.2:21-7
15. Louise Wiggins (2001) *Growing Younger with Yoga*. Rochester: Grange Books.
16. Pendersen, A.N., et al. (2003) Body Composition of 80-years Old Men and Women and its relation to Muscle strength, Physical Activity and Functional Ability. *Journal of Applied Physiology*, Vol.94:716-723.
17. Rosalind, Widdonson (1983) *The Joy of Yoga*. New York: Double Day and Company.
18. Tiwari, O.P. (1984) Yoga for Keeping Fit in the Old Age. *Swastha Hind*, Vol.28:41-44.
19. Vinu, Bhaskar, (2005) Effect of Selected Yogic Asanas on Some Selected Physiological and Psychological Variables of Elderly Men. *An Unpublished PhD Thesis submitted to the University of Kerala*.

20. Winegard, K. et al. (2003) Two years of resistance training in older men and women: the effects of three years of detraining on the retention of dynamic strength. *Canadian Journal of Applied Physiology*, Vol.28:462-474.