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Physical Fitness and Quality Of Life in Exercising V/S Non Exercising Community Dwelling Elderly

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ABSTRACT: *Background: Ageing is progressive generalized impairment of physiological, psychological functioning of the body resulting in loss of adaptive responses to external and internal stresses leading to increased risk of age associated diseases.Thus it is essential to maintain physical fitness and quality of life at optimum level in elderly. The fitness level and quality of life were evaluated by using senior fitness test and quality of life questionnaire. The senior fitness test includes six components which were upper body strength and flexibility, lower limb strength and flexibility, agility and cardiopulmonary endurance. All of these components are performed by elderly in there day to day life.*

Method: Two groups were selected (N = 40) which included 20 individuals from the exercising and 20 from non-exercising. Their fitness level and quality of life were evaluated using senior fitness test (SFT) and quality of life questionnaire which has six components to assess upper body strength and flexibility, lower body strength and flexibility, 8 foot up and go test, 2 minute step test.

Results: Comparison of SFT components and quality of life was made by using unpaired t-test and Mann-Whitney test. Analysis of the data showed significant difference in upper body strength (p-0.0189), lower body flexibility (p-0.0191), 2 minute step test (p-0.0012) and quality of life (p-0.0315) which was better in exercising elderly than non exercising elderly. Also upper body flexibility (p-0.0807), lower body strength (p-0.0988), agility (p-0.0848) was better in non exercising elderly though was not statistically significant.

Conclusion: Exercising elderly showed better upper body strength, lower body flexibility, cardio respiratory endurance and quality of life in comparison to non exercising elderly of the same age group and gender. Regular exercises have positive impact on functional, physical independence and quality of life in elderly.

KEYWORDS: *geriatrics, physical fitness, quality of life, community dwelling, ageing, senior citizen fitness test (SFT)*

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I. INTRODUCTION

Ageing is a normal physiological phenomenon. Old age constitutes one of the major challenges confronted by the elderly in the present century. The proportion of population aged 65 or above is expected to globally rise from 12.5 % in 2000 to close to 20.7% by 2050 [1]. In India, by 2050, more than one in five people will be aged over 60 [1,2] .The three key demographic changes declining in fertility , reduction in mortality and increasing survival at older ages – contribute to population ageing , reflected in a shift in the age structure from young to old [1] . The demographic transition process of declining fertility and mortality gives rise to increasing population among geriatrics [1]. The old age dependency in the population therefore gradually increases. The percentage of elderly in India has been increasing at an increasing rate in recent years. By the end of the century, the elderly will constitute nearly 34 percent of the total population in the country. With continuous longevity and declining fertility rates, the population of older persons (60 years and above) is globally growing faster than the general population [1]. Fitness is considered as the capacity to carry out the day to day activities without undue fatigue [6]. Fitness and quality of life are very important aspects of health in geriatric population. As changes of ageing occur at fast rate [6,10]. The components of physical fitness are achieved by participating in regular exercises programmers which allow the elderly living sedentary life to improve physical fitness parameters and quality to life and prevent premature onset of disease, frailty and ill health which are the most common negative effects in the life of sedentary elderly [5]. Elderly with functional limitations benefited by even a low level of physical activity which slows down the decline in physical functioning and quality of life. The elderly should be encouraged to exercise regularly by clinicians, family friends, elderly of same age groups as it provides a long term benefits by keeping the cost low, friendly environment and group based activities improves the efficacy of elderly to perform the activities better and keeps themselves motivated to perform it more better[7]. These assessments provides the objective feedback and differentiate the optimum level of physical

fitness and quality of life in both the groups which are helpful for public health initiatives and one's owns fitness level. Therefore, Study of physical fitness and quality of life was undertaken in between exercising and non exercising community dwelling elderly.

II. METHODOLOGY

The study was conducted in a tertiary health center and resident senior citizen home after department review. 40(N- 40) elderly out of which one group was of 20(N-20) exercising elderly and 20(N-20) non - exercising elderly age and gender were matched were selected over a period of 6 months for the study.All were assessed for their physical fitness using SFT and quality of life questionnaire [6, 14, 15, 16 ,11, 20]. A written consent was taken from all the elderly participants. The senior fitness test including six essential components of the test was performed and quality of life questionnaire was given to them which were to be scored. Participants were explained about maintaining confidentiality of their identity. Participants scored questions in a quiet and distraction free area. The data thus collected was statistically analyzed.

III. RESULTS

Statistical analysis of the collected data was done for the total sample size (N=40) using Graph Pad Prism 7. The data, thus obtained from 20 exercising and 20 non- exercising (N= 40) subjects over a period of 6 months for the study. The scores indicating senior fitness and quality of life in elderly among exercising and non-exercising elderly were calculated and presented graphically. Mann-Whitney test was used for intergroup comparison. Where data did not pass the normality test Two tail P value = <0.05 indicates that it is extremely significant. Exercising subjects showed higher upper body strength, lower body flexibility, cardio-respiratory endurance and quality of life scores when compared to non-exercising subjects.

Comparing Physical Fitness And Quality Of Life In Between Exercising And Non Exercising Elderly

PARAMETERS	CHAIR STAND	ARM CURL	BACK SCRATH	SIT AND REACH	8 FEET UP & GO	2 MIN STEP	QOL
Std. deviation (Exercising)	3.297	5.163	4.251	5.515	1.853	16.435	19.628
Std. deviation (Non-exercising)	3.052	3.908	5.598	5.735	2.215	8.003	15.038
P - value	0.0988	0.0189	0.0807	0.0191	0.0848	0.0012	0.0315

IV. DISCUSSION

The study compared the senior citizen physical fitness and quality of life among exercising and non-exercising community dwelling elderly . Quality of life scale and SFT (six components) were assessed[11,6,14,15,16,20] .The three components and quality of life were found to be statistically significant in community dwelling exercising elderly as compared to non exercising .

The components found statistically significant in community dwelling exercising elderly are as follows:The arm curl test for upper body strength test was found to be statistically significant in exercising elderly(p -0.0189). Training twice a week increased the muscle mass by improving the recruitment of motar units by increasing their firing rate ,reduction in sarcopenia and increased net synthesis of collagen by placing physical load on muscle increased the blood flow by increased oxygen uptake[3] .Upper body strength is necessary in both the groups for the following activities eg : lifting,carrying groceries, lifting grandchildren[6].Upper body strength was found less in group 2 than group 1 due inadequate weight training and sedentary lifestyle . The sit and reach for lower body flexibility test was found to be statistically significant in group 1 than group 2(p-0.0191). Training twice a week increased the flexibility of lower limb exercising muscle and used them in full range of motion as neuromuscular system inhibited the antagonists muscles[4] .The pumped muscles helped to remove lactic acid and other waste products in exercising elderly. The lower body flexibility is required for picking objects from floor by bending down,crossing over obstacles[6]. Lower body flexibility was found less in group 2 than group 1 due to inadequate flexibilty training and sedentary lifestyle.

The 2 minute step test for endurance was found to be statistically significant in group 1(p -0.0012) .Training twice a week increased the capacity of heart to send blood to the muscles and use increased oxygen by body enchanced heart health , improved cellular metabolism myofibre contractile function which leads to increased oxygen utilization by skeletal muscle . Good cardio respiratory endurance is necessary for follwing eg: long distance walking, shopping , jogging[6].Cardio respiartory endurance was found less in group 2 than group 1 due to inadqequate enurance training and in peripheral factor peripheral muscles cells biochemical and functional changes results in reduction of skeletal muscle cells [8].The quality of life was found to be statistically significant in group 1 than group 2 (p-0.0315) as exercises enchanced the better quality of life in elderly. QOL was found to be better in group 1 than group 2 .As good quality of life improves cognitive function ,reduces risk

of disease , health conditions and boost the self confidence ,living life at its full, social participation , happiness and reduced anxiety and fears[9].

The components found not statistically significant in community dwelling non -exercising elderly are as follows:The back scratch test for upper body flexibility was found to be not statistically significant in both the groups (p-0.0807)as both the groups were independent in their activities of daily living due to non exercising muscle atrophy occurred which limits the ROM. Upper body flexibility is necessary in both the groups eg : driving, dressing ,overhead activities[6]. upper body flexibility was better in group 1 than group 2 as stretching exercises twice a week increases the circulation and blood flow by improving range of motion .In group 2 of non exercising elderly decreased flexibility is due to decrease in subcutaneous fat and loss of muscle mass .The chair stand test for lower body strength was found to be not statistically significant in both the groups (p-0.0988) they were independent in there activities which required good lower body strength. Lower body strength was found to be better in group 1 than group 2 due to lower body strength training twice a week increased the muscle mass , improved bone health, agility and balance, prevented fall[12,13]. Good lower body strength is required in activities eg : standing ,walking, climbing stairs, grocery shopping , lifting grand children[6]. Lower body strength is lesser in group 2 due to inadequate weight training which resulted type 2 muscle fibre atrophy due reduced spinomotar neurons, increased catabolic agent such as interleukin – 6 resulted in muscle fibre wasting(Journal of Exercise Physiology and Fitness 2005 and springer link sports medicine 2012) .

The 8 feet up and go test for agility was not statistically significant in both the groups (p-0.0848) . Agility is required in both the groups for standing, walking ,climbing up stairs, crossing over obstacles and prevent falls[6]. It was found to be better in group 2 than group 1. Decreased agility in group 1 is due to deteriotation in one or more aspects of postural control there were lack of effective integrating neuromuscular and cognitive function which was the underlying cause of fall in elderly[17].This study suggested that as the physical fitness and quality of life plays vital role among the life of elderly. It helps in delaying or prevent chronic illnesses also helps in preventing the diseases associated with ageing as well as prolong independence[18,19] . The effects of exercises were seen as improvement in body composition, glucose homeostatis , insulin sensitivity and coronary blood flow. Decreased blood coagulation , blood pressure, low density lipoproptein and increased high density lipoprotein by increasing the slow twitch muscle fibre improved the elderly's psychological well being as well as maintained a good quality of life in them as exercises boosts there self –confidence, attitude towards others and self,cheerfulness as well as keep them mentally relax and healthy mind[7,18,20] .

This study showed similar results obtained by Tsui-Er Lee (2015)which showed the remarkable improvement of functional fitness in elderly women with upper limb srength,cardiorespiratory endurance and balance but flexibility doesn not reach the significance level and in male elderly improvement of upper limb strength and balance[7]. Dr. Hugh Bethell (2010) which concluded that regular exercise is most effective treatment as it prevent and treat wide range of diseases, maintain physical fitness , muscular strength and activity in old age especially (quality of life) [21].Jason E. Frankel, MDa,b, Jonathan F. Bean, MDc,d,Walter R. Frontera, MD, PhDh (2006) which concluded the type of exercise and their contribution to patient health and Lisa Womac,MEd a comprehensive view of secondary prevention cardiovasular rehabilitation programme. On the other hand in non exercising elderly most of the key aspects of physical fitness were reduced which may lead to early ageing . Deteioration of physical fitness and quality of life in them. Physical fitness and quality of life are key aspects of fitness it should be encouraged in non exercising community dwelling elderly to improve there overall function and well being.

V. CONCLUSION

This study suggested that exercising elderly have better upper body strength, lower body flexibility, cardio respiratory endurance and quality of life in comparison to non exercising elderly of the same age group. Thus, regular exercise have positive impact on functional, physical independence and quality of life in elderly**.**

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