

# Effectiveness of Exercise Program on Mobility, Activity of Daily Living and Quality of Life among Elderly Residing at Rural Area

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## ABSTRACT

**Introduction:** Aging is considered as normal and natural process of every human being, and regarded as an unavoidable biological happening. The ever changing dynamics of demographics have affected the elderly at large; wherein the impact is enormous throughout world including the developing countries like India. Elderly people face a variety of problems like inactivity, functional loss, psychiatric morbidity and diminished quality of life. The scientific evidences highlight that practice of exercise program enhances mobility, activity of daily living and quality of life. Thus the present communication was carried out to assess the effectiveness of exercise program on mobility, activity of daily living and quality of life among elderly.

**Materials and Method:** It's a true experimental study, where post test only design with control group was used among 150 randomly selected elderly people (75 was in control and 75 was in study group) residing at rural area. The elderly above 60 years of age, able to perform exercise and willing to participate (consent) were enrolled in the study. Structured interview schedule was used to assess the study variables. The collected data was analyzed with help of descriptive and inferential statistics methods.

**Results:** The results revealed that elderly who received the exercise interventions had improved mean scores on mobility and quality of life than the elderly who received the routine care, notably it was statistically significant at  $p < 0.05$  level. A significant association was existed between mobility, quality of life with socio demographic variables like age, gender and type of family at  $p < 0.05$  level.

**Conclusion:** This study demonstrated that exercise intervention was well accepted by elderly population and has significant effect towards the improvement of mobility and enhancement of health related quality of life. It should be emphasized that the practice of regular exercise programme for the reduction in physical deformities and improved wellbeing and quality of life.

**Keywords:** *Exercise program, Mobility, Activity of daily living, Quality of life and elderly*

## INTRODUCTION

Ageing is a normal, biological and universal phenomenon, and occurs in a unique way with every human being. It's a multi faceted progress where the individual's wellbeing, functional health status are inclined by a diverse factors<sup>1</sup>. It is estimated that nearly two thirds of total population aged 60 years and above are living in developing countries like India. The elderly population will increase swiftly in the next decades, and by the year 2050 nearly 8 out of 10 aged populations will live in developing regions<sup>2</sup>.

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India has around 104 million elderly persons (i.e. 8.6% of the population is comprised of 60+ aged) and the number is expected to increase to 296.6 million and constituting 20% of total population by 2050. An overwhelming majority of elderly live in rural areas, and nearly 3 out of 5 older person are poor and about two thirds of them completely economically dependent<sup>3</sup>. The elderly in India face amalgamation of numerous physical, psychological and social health problems. As age advances there is an increased morbidity, inactivity, functional loss and diminished quality of life<sup>4</sup>.

A community based study on quality of life of elderly of rural area highlights that an elderly had significant lower level of quality of life in domains like social relation and environment than the urban population<sup>5</sup>. The elderly who did not had education, not receiving pension, not along with partner, having musculoskeletal disorders and belongs to nuclear family had significantly lower Quality of Life score<sup>6</sup>.

Given the rate of aging population that developing countries like India are experiencing, there is a necessity to focus on ageing related issues particularly on activity of daily living and quality of life. Scientific evidence had indicated that physical activities impacts on both physical and mental health i.e. the more active elderly enjoyed a higher quality of life and wellbeing status. The practice of regular and constant exercise program and physical activities improve different domains of quality of life, especially physical, social and role taking which leads to individual's independence in doing their daily activities<sup>7</sup>. Physical exercise programme and activities does have a positive correlation with healthy aging in elderly population, thus the present study was carried out to assess the effectiveness of exercise program on mobility, activity of daily living, quality of life among elderly population.

## **MATERIALS AND METHOD**

A true experimental study was carried out on elderly residing at rural area of Rahata Taluka, Ahmednagar District, Maharashtra. Sample size was calculated using Openepi, open source calculator – SSCC. The estimated sample size for case – control study was 150 i.e. 75 in cases and 75 in controls, by Fleiss method with correction factor. Elderly were selected by using simple random sampling technique, based on criteria's

of selection. The elderly who were 60 years or older, ability to undergo exercise programme and willing to participate were included, wherein elderly who were institutionalized, acutely ill, unable to perform exercises and has cognitive impairment or chronic disorders were excluded from the study.

An ethical approval was obtained from Institutional Ethics Committee of Pravara Institute of Medical Sciences (Deemed to be University), Loni (Bk). The purpose of study was explained to the elderly, and a written informed consent was taken before the enrollment. After collecting baseline data, 150 elderly were randomized to study group (n=75) and to the control group (n=75) respectively. From the study population odd number elderly is chosen (first sample) was enrolled in study group and even number elderly (second sample) in the control group and so on... till the achievement of determined sample size. Elderly in study group received exercise program administered by a principal investigator, whereas elderly in control group received routine care. Exercise program consists of a) Basic exercise i.e. warm up and stretching exercise b) Muscle strengthening exercise c) Balance and gait training and d) Home exercise – are performed two sets of exercises minimum 30 minutes for atleast three times a week. Exercise record diary was provided to elderly to record the performance for 3 months, and the investigator was followed up the elderly once in a 15 days.

Pre tested structured interview schedule was used to gather data, it consists of section A – Socio demographic characteristics, section B – Elderly mobility scale, section C – Activity of daily living scale and Section D – WHO QOL BREF scale. The elderly of study group received exercise program for three months (three times a week for minimum of 30 min), while the post test was carried out for both groups after three months of post intervention. All the data were gathered and recorded; further collected data was tabulated and analyzed by applying appropriate statistical tests like mean, SD, Z test and chi square test. The statistical level of significance was calculated at  $p < 0.05$  level.

## **RESULTS**

A total of 150 elderly were participated in the study, and baseline data were well balanced between the control and study group. Table 1 shows the distribution of elderly population in the study according to their socio demographic data.

**Table 1: Distribution of elderly according to socio demographic data**

Socio demographic data	Control group (n=75)		Study group (n=75)	
	No (f)	Percent (%)	No (f)	Percent (%)
<b>Age</b>				
60 – 65 years	32	42	27	36
66 – 70 years	18	24	20	27
> 70 years	25	34	28	37
<b>Gender</b>				
Male	38	51	30	40
Female	37	49	45	60
<b>Marital status</b>				
Married	46	61	41	55
Widow/Widower	29	39	34	45
<b>Education</b>				
No formal education	04	05	02	02
Primary	58	78	60	80
Secondary	07	09	07	09
Higher secondary	06	08	06	09
<b>Occupation</b>				
Home maker	30	40	39	53

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Daily wages	06	08	05	06
Agriculture	28	37	28	37
Private employee	11	15	03	04
<b>Monthly income</b>				
Below Rs.3000	52	69	50	66
Rs 3001 – 6000	09	13	12	17
Rs 6001 – 9000	04	05	04	05
Above Rs. 9001	10	13	09	12
<b>Type of family</b>				
Nuclear	15	20	18	24
Joint	53	71	49	65
Extended joint	07	09	08	11
<b>Religion</b>				
Hindu	51	68	48	64
Christian & Muslim	24	32	27	36
<b>Residential status</b>				
Living alone	05	07	03	04
Living with spouse	16	21	20	27
Living with spouse and children	48	64	45	60
Living with son/daughters	06	08	07	09

**Table 2: Effectiveness of exercise program on mobility, activity of daily living and quality of life of elderly**

Variable	Control group (n=75)		Study group (n=75)		Z value
	Mean	SD	Mean	SD	
Mobility	16.21	3.19	18.04	1.79	3.19*
Activity of daily living	5.84	0.57	6.00	1.13	0.81
Quality of life	79.29	8.71	90.52	9.86	4.86*
a) Physical domain	22.75	3.11	25.75	3.92	
b) Psychological domain	18.52	2.83	21.52	3.38	
c) Social domain	10.63	1.37	10.49	0.71	
d) Environment domain	27.41	2.54	32.07	4.11	

\* Significant, Table value: 1.96 at p<0.05 level

Based on data in table 2, the post test mean scores of mobility (18.04±1.79) and quality of life (90.52±9.86) in the study group was higher than control group (16.21±3.19) and (79.29±8.71) respectively, and the difference between two groups was statistically significant. However the results from Z test did not show significant difference in activity of daily living at p<0.05 level. It interprets that the exercise program was effective in improving the mobility and quality of life of elderly population.

**Table 3: Association of mobility, activity of daily living and quality of life with socio demographic data**

Variables	df	Mobility ( $\chi^2$ value)	Activity of daily living ( $\chi^2$ value)	Quality of life ( $\chi^2$ value)
Age	1	3.97*	0.31	5.71*
Gender	1	5.27*	0.06	0.69
Education	1	0.03	0.62	0.22
Monthly income	1	1.35	0.09	1.68
Occupation	1	2.73	1.79	1.28
Type of family	1	0.62	0.91	3.86*

\*Significant, Table value: 3.84 at  $p < 0.05$  level

Table 3 depicts that the elderly in study group had a statistically significant association between mobility and age and gender; similarly the quality of life had association with age and type of family. However the other variable i.e. activity of daily living did not had association with any of the socio demographic variables at  $p < 0.05$  level. There was a moderately positive correlation ( $r=0.52$ ) was existed between variables such as mobility and quality of life of elderly.

## DISCUSSION

Evidences have envisage that the elderly has problems in mobility, activity of daily living and reduced quality of life, wherein the national health policy for elderly presents a directive for the promotion of active and healthy aging that refer to maintenance of functional independence and autonomy throughout aging, allowing the involvement in social, economic, cultural, spiritual and civic activities<sup>8</sup>.

It was evident from the findings that the elderly who practiced exercise programme had statistically improved enhanced quality of life than the elderly who did not perform exercises. It interpret that the exercise program is important to maintain quality of life, and effective in improving the mobility and quality of life. This finding was consistent with study that a low intensity physical exercise programme contributes in maintaining quality of life as well as the psychological aspects of elderly people<sup>9</sup>.

The study findings reinforced the importance of physical activity and exercise for elderly people to improve the mobility and functionality. Exercise is an essential component for mobility and functional maintenance for all including the elderly people, this fact was well documented in a study that exercise program

group showed improvement in mobility, balance and flexibility than the elderly who had walking activity<sup>10</sup>.

There was a significant association existed between quality of life and socio demographic variables like age and type of family; and a positive correlation was prominent between the mobility and quality of life of elderly. It was in congruence with study results that a significant correlation was found between age, gender of elderly with the quality of life score<sup>11</sup>; and found a strong positive relationship between quality of life, activity of daily living and elderly mobility<sup>12</sup>.

In addition to this study results, numerous systematic reviews had recommended that the exercise is one of the effective and non pharmacological intervention to improve the quality of life of elderly. As a health service provider, nurses needs to assess the problems of elderly and tries to minimize or resolve problems and improves the wellbeing, self esteem with specific nursing interventions. In conjunction with it is important to create awareness on exercise programme through education and training to improve the understanding and compliance with exercise therapy of elderly.

## CONCLUSION

The elderly suffers with variety of health problems including mobility, functionality and poor quality of life. The low intensity exercise program consist of basic exercises like warm up and stretching exercises, muscle strengthening exercises and balance and gait training exercises contributes in improvement of mobility, wellbeing and various aspects of quality of life of elderly population. The results of study highlight the same in lucid manner along with statistical inference. It is a cost effective non pharmacological intervention to

be applicable in most of elderly in Indian settings for better health related outcomes. The exercise training programmes must be provided to all elderly and encourage them to practice with sufficient compliance for the long term sustainable health related outcomes.

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