

Cross Sectional Study on Association of Physical Activity with Nutritional Status and Quality of Life of Geriatric Population of Anand, Gujarat

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How to cite this article: Stephen R. Christian, Sweta H. Panchal, Parth T. Patel et al. Cross Sectional Study on Association of Physical Activity with Nutritional Status and Quality of Life of Geriatric Population of Anand, Gujarat. Indian Journal of Public Health Research and Development / Vol. 16 No. 4, October-December 2025.

Abstract

Background: The elderly population experiences significant physiological changes. A reduction in the body's capacity to detect essential senses like hunger and thirst is a problem that people may encounter as they age. Being physically fit helps person to conquer many health-related problems, so finding association between them would help in future to guide and educate them about importance of Physical activity and nutritional status. This study aimed to find the correlation of physical activity with nutritional status and quality of life in geriatric population.

Methodology: This is a cross-sectional study including 200 people from Anand, Gujarat, India.

Result: The present study found statistically significant positive correlation in between Physical Activity Scale for Elderly (PASE) and Mini Nutritional Assessment scale (MNA) suggesting higher physical activity is associated with better nutritional status. The present study found statically significant positive correlation between PASE and WHO- Quality of life (WHO-QOL) Brief total score. Suggesting a higher physical activity is associated with better quality of life status in elderly.

Discussion and Conclusion: Geriatric people having high levels of physical activity and nutritional status show improved quality of life. Furthermore, this research emphasizes regular physical activity along with a balanced nutritional status should be inculcated in geriatrics for them to maintain good health.

Keywords: Geriatrics, Physical Activity, Nutrition, Quality of life, Physiotherapy.

Introduction

According to the United Nations (UN), a geriatric is defined as a person 60 years or older (UN, 2001).

Engaging in regular physical activities helps maintain mobility and independence in old age; improves physical and mental functions; and reverses some effects of chronic conditions or diseases [1]. Simple

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Submission date: 28 Feb 2025

Revision date: 7 April 2025

Published date: September 24, 2025

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exercises like walking can help to strengthen bones and muscles, manage weight, lower risk of diseases, and improve one's ability to do daily activities. [2]

Geriatric populations change significantly as they age. Physical activity is safe for both healthy older adults and those who are frail, with consistent participation in activities such as walking at low intensities to more high-intensity sports or resistance exercise reducing the risk of major cardiovascular disease, metabolic disorders, obesity, falls cognitive impairments osteoporosis, muscular weakness among others [3]. Clinicians, family members, friends can impact on older persons by encouraging them to increase their activities while minimizing costs but increasing enjoyment facilitating group-based exercises or enhancing self-efficacy towards exercise. A review found that the Physical Activity Scale for the Elderly is a widely used PA measure among community-dwelling older adults. [4]

Regular exercise has advantages that go beyond calorie balance and weight maintenance. Research conducted on ambulatory older adults revealed a positive correlation between poor nutritional condition and physical performance. [5]

One of the challenges of aging is a reduced calorie requirement. Unfortunately, this poses a problem for nutrition. The number of calories a person needs daily is contingent upon many factors: height, weight, muscle mass, activity level, and so on. While taking in fewer calories, the elderly have to get as much if not more of some specific nutrients. Fortunately, this can be achieved by eating whole foods and supplementing. A decline in the body's capacity to detect essential senses like hunger and thirst is another problem that people may encounter as they age. Your risk of dehydration and unintentional weight loss may increase as a result. And these consequences might be more severe with increasing age. [6]

Older adults consume fewer calories than younger people due to the tendency of older adults to move and exercise less and their lower muscle mass, therefore they require nutrient dense foods to maintain their daily allowance. The importance of eating a variety of whole foods, including fruits, vegetables, fish, and lean meats, for older people is heightened as a result.

Progressive physiological decline may impair one's capacity for doing an array of tasks, which can have a negative effect on one's quality of life. Studies in the past have clearly shown how the respiratory system's capacity decreases with age and the effect that regular physical activity has on this reduction. [7]

Over the past few years, policymakers and healthcare professionals have become more aware of the need to increase the physical activity of older adults. The data indicates that enhancing older patients' physical capabilities, lifestyle choices, and quality of life may support resilience-building and healthy aging. In epidemiologic studies, a practical and popular method for assessing physical activity is the use of a physical activity questionnaire. PASE was first created in the early 1990s as a tool for investigating primarily older individuals through an age-specific physical activity questionnaire. [8]

WHO defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns [9].

Aims:

To find the correlation of physical activity with nutritional status and quality of life of geriatric population.

Objectives:

Primary objective

To correlate physical activity with quality of life and nutritional status in geriatric populations

Secondary objective

To find the association between physical activity with gender, number of meals/ day, and presence and absence of Hypertension, Diabetes Mellitus and Osteoarthritis of knee.

Need of the Study

Physical activity, quality of life and nutritional level are one of the important aspects of life. Being physically fit helps person to conquer many health-related problems. Geriatric is vast field and there still is lack of data available especially when talking about Indian context. So, this study intends to provide the

data regarding Physical activity and its correlation with quality of life in addition with nutritional status. This would help in the future to guide and educate elderly about importance of Physical activity and nutritional status.

Methods:

Study Design: Cross-sectional Observational study

Sample Size: The sample size was calculated using the formula for estimating proportions in a population, considering a 10% prevalence of the geriatric population in Anand, a 95% confidence level ($Z = 1.96$), and a 5% margin of error, resulting in an initial sample size of 138. After applying the finite population correction, the adjusted sample size was 137, which was further increased to account for a 10% non-response rate. To enhance the study's power a final sample size of 200 was considered appropriate.

Sampling Method: Convenient sampling

Study Setting: Department of Physiotherapy, Shree B.G. Patel College of Physiotherapy, Anand and Anand District.

Study Duration: 3 months

Eligibility Criteria

Inclusion criteria:

- Geriatric population in the age group of >60 years with/without comorbidities like osteoarthritis, diabetes mellitus and hypertension, and those having stable vital parameters
- Geo graphically- Anand district.

Exclusion criteria:

- Inability to provide consent form
- History of recent fracture (last 6 months)
- History of any recent cardiac or pulmonary surgery (last 6 months).
- History of any recent surgery (last 2 months).
- Known case of psychiatrist disorder
- Lower limb amputation at any level
- Known case of neurological complications.

Outcome measures:

Pase (Physical Activity Scale for Elderly)

The Physical Activity Scale for the Elderly (PASE) is a short and easy to score (5 minutes) instrument made specifically for measuring physical activity in epidemiologic research among individuals aged 65 years and over. [4]

World Health Organaization Quality of Life Scale (WHO-QOL)

A 26-item WHOQOL-BREF questionnaire with four groups, namely physical health (7 items), psychological health (6 items), social relationships (3 items) and environmental health (8 items) and also includes some QoL and general health questions. [10]

MNA (Mini Nutritional Scale)

The total score of the MNA differentiates between old people consisting of: 1) adequate nutritional status ($MNA > \text{ or } = 24$); 2) protein-calorie malnutrition, ($MNA < 17$); 3) at risk of malnutrition (MNA between 17 and 23.5). [6]

Procedure:

Subject were taken from Shree B. G. Patel College of physiotherapy, and from the community setting in Anand District. 249 people were assessed out of which 200 met eligibility criteria. The purpose and procedure of the study was explained to each patient. Written consent was taken prior to the study from each patient. Finally, data processing and analysis was carried out to create an inference.

Statistical Analysis

All the statistical analysis were performed in IBM SPSS statistic v-26. Shapiro-Wilk test was used to assess normality of data. Data are represented in the form of mean and standard deviation for parametric data and median and IQR for non-parametric data. Spearman Ranked test was used to find correlation between variables. Independent sample Mann-Whitney U Test was used for analysis of categories of Gender, presence or absence of Hypertension, Diabetes mellitus and osteoarthritis.

Result

Observation of 200 patients were taken. All the observation were taken by a qualified and experienced physiotherapist.

Table 1: Demographic data

Number ^b	200	
Age ^c	68 (64-72)	
Gender (Male) ^b	97	
Hypertensive ^b	122	
Diabetic ^b	67	
Osteoarthritis ^b	109	
Meals/day ^c	2 (1-2)	
MNA ^c	24 (22-26)	
WHO-QOL Brief ^c	Physical Health	60 (53-71)
	Psychological Health	62 (54-70)
	Social Health	75 (66-83)
	Environmental health	68 (59-75)
	Overall health score	75 (62-75)
PASE	257 (250-265)	

(MNA- Mini Nutrition Assessment Scale, WHO-QOL Brief- WHO Quality of Life Questioner brief, PASE- Physical Activity Assessment Scale for Elderly)

^a- Normally distributed Data, ^b- Data expressed as (number), ^c- D Data expressed as (Median and IQR₁₋₃)

The data did not adhere to a normal distribution, as found using Shapiro-Wilk test. Our data consisted of 200 individuals with mean age of 68.4, amongst them 97 were males. As can be seen in Table 1, amongst 200 people, 122 had hypertension, 67 had diabetes mellitus and 109 had osteoarthritis. And on average they had 2 meal per day. Their average Mini Nutrition Assessment Score was 23.86, overall average WHO-QOL was 71, and average PASE score was 262.

Table 2: Association of PASE with different variables

Variables		Correlation coefficient	P-value
Age ^s		0.074	
Gender ^u			0.635
Meals/day ^s		0.092	
Hypertensive ⁱ			0.122
Diabetic ^u			0.006*
Osteoarthritis ^u			0.001*
W H O - Q O L Brief ^s	Physical Health	0.235**	
	Psychological Health	0.410**	
	Social Health	0.254**	
	Environmental health	0.456**	
	Overall health score	0.250**	
MNA ^s		0.222**	

^u - Independent sample Mann-Whitney U Test;

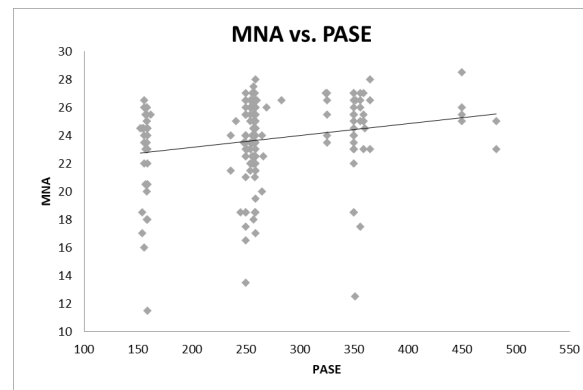
ⁱ-Independent sample Kruskal-Wallis test;

^s - spearman’s ranked test; MNA- Mini Nutrition Assessment Scale, WHO-QOL Brief- WHO Quality of Life Questioner brief, PASE- Physical Activity Assessment Scale for Elderly.

#-Significant association,

*- significant correlation at α value 0.05,

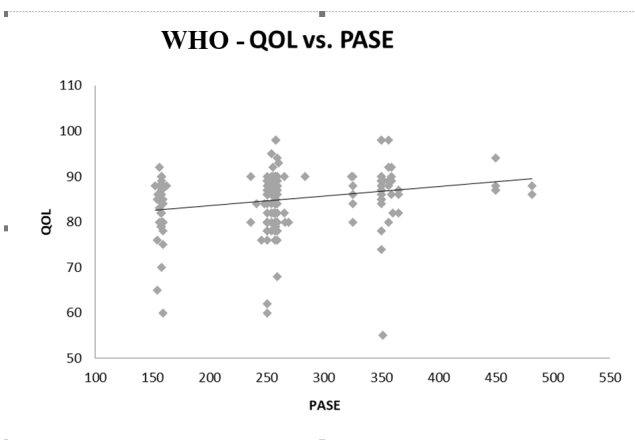
** - significant correlation at α value 0.01.



MNA – Mini nutrition assessment scale; PASE - Physical Activity Assessment Scale for Elderly

Figure 1: Scatter plot graph of PASE vs. MNA

The present study found statistically significant positive correlation in between PASE and MNA with correlation coefficient value of 0.222, as can be seen in Table - 2. Suggesting a higher physical activity is associated with better nutritional status which is depicted in scatter plot diagram in Figure 1.



WHO - QOL - WHO Quality of Life Questioner brief -
PASE - Physical Activity Assessment Scale for Elderly

Figure 2: Scatter plot graph of PASE vs. WHO - QOL

The present study found statically significant positive correlation (Correlation coefficient=0.250) between PASE and WHO-QOL Brief total score as can be seen in Table - 2. Suggesting a higher physical activity is associated with better quality of life status in elderly which is depicted in scatter plot diagram in Figure 2.

The present study also found that non diabetic and elderly without osteoarthritis had better physical activity compared to elderly with diabetic; and osteoarthritis with p value of 0.006 and 0.001 respectively.

Discussion

A study shows that the Japanese population with mean age of 73 had mean PASE value of 155 and the Canadian population with mean age of 75 had mean PASE value of 174 which is much lesser compare to the present study population with mean age of 68.4 and mean PASE value 257. [11]

Many of the age-related health issues can be avoided or delayed by exercising regularly. Additionally, regular exercise supports muscular

growth so that you may continue carrying out daily tasks independently. Physical activity may strengthen the bones and muscles, help to maintain a healthy weight, increase the ability to carry out daily tasks, and improve cognitive health. [11]

Yves Guigoz et al. (2011) in their study on nutrition, health, and ageing, reported that the mean score for the nutritional assessment was 24, which is almost similar to the mean score for this study, which was 23.67. Age-related bodily changes increase vulnerability to nutritional deficiencies, which can negatively impact all facets of health, including physical, mental, and social wellbeing. As age increases, maintaining a healthy weight and giving body the correct nutrition can help to stay independent and active. Additionally, it can aid in reducing or even preventing the symptoms of long-term illnesses like diabetes or heart disease. [12]

In study conducted by Venu R. Shah, et al (2017) a mean WHO-Quality-of-Life score of physical health, psychological health, social relationships, and environmental health was found 64.9, 66.2, 69.4 and 57.6 respectively, which is similar to our study. Quality of life is crucial to elderly because it gives a reason to keep going rather than just giving up and accepting their fate. [13]

This study showed positive correlation ($r = 0.250$) between physical activity and QOL. According to the study, Lakshmi Prasad, Et. Al. (2021), in India the correlation between physical activity level and WHO-QOL total score was ($r = 0.315$) which is similar our study. [14] Showing was a positive correlation of QOL with physical function and physical activity level. Older adults prefer QOL compared to longevity. Rétsági *et al.* [15] and Puciato *et al.* [16] in their study among older adults reported a positive relationship between physical activity level and QOL. The common side effects of aging can be reduced by increasing physical activity which would reduces risk factors and also delays the onset or decreases the side effects of aging and improves QOL. [17]

This study showed positive correlation ($r = 0.222$) between nutritional status and physical activity. Aging is a complex process of physiological and social changes that leads to disease, disability, and the lower experience of happiness. Positive correlation was also found between MNA and PASE

score ($r=0.31$, $p<0.01$) in one study. [18] In a simple term, malnutrition is associated with a poor diet or deficiency of micronutrient which results in reduced levels of physical activity. Physical activity increases the need for some vitamins and minerals. A well-balanced diet will supply enough vitamins and minerals to cover any increased need due to activity.

Our study found that individuals without osteoarthritis and/or diabetes mellitus exhibited higher levels of physical activity compared to those with these conditions. The reduced physical activity in individuals with osteoarthritis can be attributed to pain during weight-bearing movements, leading to decreased mobility. Similarly, diabetes mellitus is associated with various complications which may further limit physical activity. These findings highlight the significant impact of musculoskeletal and metabolic disorders on physical activity levels in the geriatric population, underscoring the need for targeted interventions to promote mobility and overall well-being in affected individuals.

Conclusion

The findings of this study show a positive correlation between physical activity and the quality of life as well as nutritional state for geriatrics. Also, older adults have an improved overall quality of life when they have high levels of physical activities and nutritional status. Furthermore, these research results emphasize on making a habit where old people should exercise regularly to maintain good health.

Given the growing evidence of the benefits of physical activity for older individuals, there is need for future research to explore the mechanisms behind this relationship, and examine how different types and intensities of physical activity impacts various aspects of health in elderly population. In addition, if put into practice; this information will help in designing interventions which can be used in order to enhance the wellbeing among old people through promotion of exercising.

Limitation of the Study

- The data was only taken from Anand / Gujarat/India.
- Due to lack of resources only 200 peoples were included in study.

- Co-morbidities can be individually analysed amongst varies groups which would show detailed correlation.
- Nutritional status using biological markers could not be assessed.
- All the data taken are based on subjective memory, and are at risk of biases.

Future recommendation:

- Future study should include various geographical areas of India.
- Larger sample size must be taken.
- Individual variables that can affect nutritional status must be kept under consideration.
- Biological markers for nutritional status should be used for actual nutritional status.

Acknowledgements

We would like to thank management of Shree B.G. Patel College of Physiotherapy, Anand, Gujarat, India, for providing us support to carry out this research. We also thank Bhautik Pandya (Statistician) for statistical guidance for this research.

Funding Sources if applicable: Not applicable

Conflict of interest: Nil

Ethical Clearance: Not applicable

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