# Physical Activity of Community- Dwelling Elderly Population in Gujarat, India: A Cross-Sectional Study

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## *ABSTRACT*

***Purpose:*** *While ageing is an inevitable phenomenon of life, physical activity is important for healthy ageing. Compared to the other age groups, older adults throughout the world have the lowest rate of participation in recommended levels of physical activity. This study aimed to investigate the physical activity status of the community-dwelling elderly population in Gujarat, India.*

***Method:*** *This was a cross-sectional study. A door-to-door survey was conducted among selected communities near Vadodara in Gujarat. Based on the inclusion criteria (age≥60years, MMSE-≥24), 347 elderly persons were included in the study. Data was collected using the Global Physical Activity Questionnaire (GPAQ), and analysed using descriptive statistics.*

***Results:*** *Among the 347 older adults (mean age 67.43±7.46 years) who participated in the study, 159 were male and 188 were female. While 125 participants (36%) were physically active at levels recommended by the World Health Organisation, 222(64%) were physically inactive.*

***Conclusion****: Only 36% of the participants were physically active as per WHO recommendations. The men were more physically active than the women in the study sample. This study implies that there is a need to create an awareness regarding the importance of physical activity for healthy aging.*

***Key words****: healthy ageing, WHO, physical activity, community- dwelling elderly*

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# INTRODUCTION

The World Health Organisation (WHO) defines physical activity (PA) as 'any bodily movement produced by skeletal muscles that requires energy expenditure', such as working, playing, carrying out household chores, travelling, and engaging in recreational activities. For older adults the recommended duration of physical activity is a minimum of 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity or their equivalent combination per week (WHO, 2010).

Evidence suggests that participating in regular moderate-intensity physical activity, e.g., walking, cycling and light sports, as well as light-intensity activity, e.g., easy walking (<4.5 km/h), has significant benefits for health (The Department of Health, Australian Government, 2019). Physical activity helps to avoid the risk of injury and falls, improves health-related quality of life, reduces depression, reduces sedentary activities, gives a feeling of being in good health, improves cognitive function, mood, self-esteem, general mental health, short or long-term memory, and sleep (Warburton, 2017). It also decreases the risk of cardiovascular disease, hypertension, diabetes mellitus, lung disease, bone disease, and cancer (Warburton, 2017).

Physical inactivity is more common among women, elderly people and rich countries (Gamage, 2019).Compared to all age groups throughout the world, older adults have the lowest rate of participation in recommended physical activity (WHO, 2010). A study by Musich (2017) found that only 12% of adults aged 75 years and older were involved in 30 minutes of moderate physical activity for five days or more per week.

Older adults with visual impairment, hearing impairment, musculoskeletal disease, and incontinence have a lower level of physical activity than their peers without these conditions (Bryan, 2011). Participation in physical activity is influenced by many factors such as age, gender, education, lack of time, self-efficacy, barriers to exercise, social support from friends and peers, social support from spouse/family, access to facilities, hilly terrain, enjoyable scenery, neighbourhood safety, and various internal and external barriers (Trost, 2002; Schutzer, 2004).

Increasing PA among elderly persons has become an international priority (WHO, 2015). In India there is a lack of studies based on physical activity in connection with healthy ageing.

### Objective

The objective of this study was to focus on the physical activity status of community-dwelling elderly individuals, and its association with gender and occupation.

## METHOD

### Study Design

This was a cross-sectional study with men and women above 60 years of age, from selected communities near Vadodara in Gujarat, India.

### Study Sample

The Sarpanch and Primary Health Centres of selected villages were approached for permission to conduct the study. After obtaining permission from both, a door-to-door survey was undertaken. The purpose of the study was explained to elderly persons, 60 years of age or older, whom the researcher encountered. Those who were willing to participate were asked to sign a written informed consent form. After this, they were given an information sheet with more details about the study.

In accordance with the inclusion criteria of having a Mini Mental State Examination (MMSE) score ≥24, the recruited elderly persons were screened using a physiotherapy assessment form including a Mini-Mental State Examination (MMSE) (Creavin et al, 2016). Male and female subjects, above 60 years of age, with MMSE≥24 and willing to participate, were included in the study.

Sample size was calculated as 347 ($n = \frac{Z^2\ P\ (1-P)}{d^2}$,)

Where Z= statistic for the level of confidence at 95% confidence interval Z=1.96,

P= Expected prevalence of proportion at 67% P=0.67, and

d= Precision at 0.05.

### Data Collection

Three hundred and fifty one (n=351) elderly persons from the Bhadalpur and Waghodia communities were approached at their door-steps, out of which four persons declined to participate in the study. The remaining 347 participants were

screened for inclusion criteria and the data was collected using the Global Physical Activity Questionnaire (GPAQ). This questionnaire was developed by the WHO to assess the frequency and intensity of physical activity in different settings. It collects information on physical activity participation in three domains (settings), namely, activity at work, travel to and from places, and recreational activities as well as sedentary behaviour. Screening and administering a questionnaire required approximately an hour to collect the data from a single participant. On an average, data was collected from 2-3 participants per day for five days in a week.

### Data Analysis

All statistical analysis was performed using Statistical Package for Social Sciences version (SPSS 25). Descriptive statistics including mean, standard deviations, and standard error were computed for all variables.

### Ethics Approval

The study was approved by the Sumandeep Vidyapeeth Institutional Ethical Committee (SVIEC/ON/PHYS/BNMPT17/D18007). Data collection started after obtaining the SVIEC approval.

## RESULTS

Although 351 community-dwelling elderly individuals were screened, there were only 347 participants in the study. Four individuals declined due to prior commitments. The predominantly female participants numbered 188 or 54%, while the male participants were 159 in number or 46%. They were all from Bahadalpur and Waghodia areas, and the mean age was 67.43±7.46 years. The pattern of physical activity of all the participants, according to the four domains of the WHO questionnaire, is shown in Table 1.

**Table 1: Pattern of Physical Activities in a typical week among Community-dwelling Elderly People (N=347)**

| Pattern of Physical Activities | N (%) | Mean MET- minute |
|---|---|---|
| Activity at work | | |
| Vigorous intensity | 07(2%) | 3300 |
| Moderate intensity | 41(12%) | 357.55 |

| | | |
|---|---|---|
| Travel to and from places | 264(76) | 737.84 |
| Recreational activities | | |
| Vigorous intensity | 0 | 0 |
| Moderate intensity | 2(0.9) | 150 |
| Sedentary behaviour(min) | 347(100%) | 326.94 |
| Total activities in MET-minutes | | |
| MET Score < 600 (Physically Inactive) | 222(64%) | 1892.34 |
| MET Score ≥ 600 (Physically Active) | 125(36%) | 2822.56 |
| Total population | 347 | 1201.09 |

Based on the GPAQ, the study population can be divided into 2 two groups. Those with <600 MET score are classified as physically inactive and those with ≥600 MET score are categorised as physically active. Demographic characteristics of physically active and physically inactive groups are shown in Table 2.

**Table 2: Demographic Characteristics of both Groups (N=347)**

| **Demographic Variables** | **Active Group N (%) 125 (36)** | **Inactive Group N (%) 222 (64)** | **Total N(%) 347(100)** |
|---|---|---|---|
| **Gender** | | | |
| Male | 90(72) | 69(31) | 159(46) |
| Female | 35(28) | 153(69) | 188(54) |
| **Age Group** | | | |
| 60-69 years | 96(77) | 144(65) | 240(69) |
| 70-79 years | 20(16) | 50(23) | 70(20) |
| 80-89 years | 09(7) | 25(11) | 34(10) |
| 90-99 years | 00 | 3(1) | 3(1) |
| **Body Mass Index (BMI)** | | | |
| Underweight | 11(9) | 17(8) | 29(8) |
| Normal | 71(57) | 94(42) | 165(48) |
| Overweight | 23(18) | 51(23) | 72(21) |
| Obese | 20(16) | 60(27) | 80(23) |

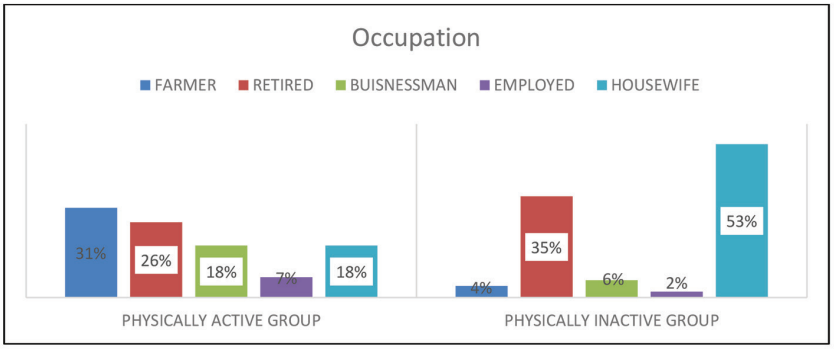
| | | | |
|---|---|---|---|
| **Occupation** | | | |
| Retired | 32(26) | 78(35) | 110(32) |
| Farmer | 39(31) | 08(4) | 47(13) |
| Businessman | 22(18) | 13(6) | 35(10) |
| Employed | 09(7) | 05(2) | 14(4) |
| Housewife | 23(18) | 118(53) | 141(41) |
| **Education** | | | |
| Illiterate | 16(13) | 38(17) | 54(15) |
| Primary school | 41(33) | 91(41) | 132(38) |
| Secondary school | 49(39) | 72(32) | 121(35) |
| College | 19(15) | 21(10) | 40(12) |

The data of the present study did not fall under normal distributions such as the Shapiro-Wilk normality test with significant result of p-value <0.05. Therefore, non-parametric chi-square test and Spearman's correlation coefficient test were used for significant association among various variables. These are shown in Table 3 and Figure 1.

**Table 3: Association of GPAQ with Gender and Occupation (N=347)**

| | VARIABLE | CHI-SQUARE VALUE | CORRELATION COEFFICIENT | P-VALUE |
|---|---|---|---|---|
| **GPAQ** | GENDER<br>OCCUPATION | 53.937<br>86.816 | 0.394**<br>0.331** | <0.01<br><0.001 |

**Figure 1: Global Physical Activity Questionnaire (GPAQ) on different Occupations (N=347)**



## DISCUSSION

This study was an attempt to learn about the physical activity levels of the community-dwelling elderly population. Only 36% of the individuals in the study sample were physically active according to WHO- recommended levels. As per WHO recommendations, inclusive of the activity for purposes of work, transport and leisure throughout a week, an adult should perform at least 150 minutes of moderate-intensity physical activity or 75 minutes of vigorous-intensity physical activity, or an equivalent combination of moderate and vigorous-intensity physical activity, achieving at least 600 MET-minutes (WHO, 2010).

Literature on the subject, has pointed - for quite some years already- to the decline in the physical activity of the elderly population across the globe. In the USA, Centres for Disease Control and Prevention (CDC) reported that 26.9% of adults aged 65–74 years and 35.3% aged ≥75 were found to be physically inactive (Kruger, 2007). In the UK, the Health Survey for England reported that 50% of adults aged 65-74 years and 74% aged 75 years or older were found to be physically inactive (Trinh, 2008). In one of the studies done in Canada by the National Advisory Council on Ageing (NACA) in 2006, it was reported that 62% of adults aged 65 years and older were physically inactive (Rotermann, 2006). Similar to their findings, in the present study, 42% of adults aged 60-69 years and 22% of adults aged 70 years and older (in total 64% of adults above 60 years of age) were found to be physically inactive when assessed with the Global Physical Activity Questionnaire (GPAQ). One of the possible reasons for inactivity among the elderly population, as stated in the literature, is that physical activity is not being given much importance by the elderly as compared to the medication (Shaheen, 2016).

A study by De et al (2018) on the elderly population in an urban slum area of West Bengal in India, reported that 24% of the participants were involved in physical activity of vigorous intensity, 36% in physical activity of moderate intensity. For 19.8%, physical activity took the form of travel to and from places, 5.6% were involved in vigorous recreational activities, 17.9% in moderate level of recreational activity, and only 3% of the participants were inactive, as assessed by the GPAQ Scale. However, by using the same questionnaire, the current study found only 2% carried out vigorous physical activity, 9.4% performed moderate-intensity physical activity at their workplace, 76% experienced physical activity in the form of travel to and from places, 0.6% had recreational activities of moderate-intensity, and 12% were inactive. De et al (2018) suggested that the

much higher proportion of physically active/highly active elderly individuals in their West Bengal study could be due to the poor socio-economic status of the participants from the slum area.

In the United States, Conn et al (2002) found that only 12% of adults aged 75 years and older were engaged in 30 minutes of moderate physical activity for 5 days or more per week while 65% reported no physical activity.Approximately 40% - 80% of the older adults do not meet the recommended physical activity standards, according to the finding of a systematic review by Notthoff et al (2017). In the present study, only 0.6% of participants aged 75 years and older were engaged in 60 minutes of moderate physical activity for 3 days or more per week, 0.3% of adults were engaged in vigorous physical activity on a regular basis, 11% were involved in moving to and from a place, and 4% of participants were totally inactive.

According toWarburton (2006), in Canada walking is reported to be the most popular physical activity among adults aged 65 years and older, with 65% of older adults opting to walk. However, in the present study, only 51% of the participants in the same age group of 65 years and above, did 30-60 minutes of walking in a day per week, in the form of exercise, transportation (to shops and market), for leisure or for daily activity. The elderly population is the most sedentary population, even when one considers walking which is the most popular and accessible activity for them (Notthoff et al, 2017). In the present study, only 12% of the elderly population was involved in activity of moderate intensity, and only 2% undertook high-intensity activity in the form of occupational pursuits like farming, handling cattle, pottery, cutting wood, tailoring, and working as house help and in the construction sector.

Statistically significant association of physical activity with gender and occupation was found in the present study. Gender is an important factor that influences the physical activity levels of the older population. One of the studies (McPhee, 2016) reported that women were more inactive as they had lower levels of education and income, fewer were married, and a greater number was living alone. In addition, women perceiving their health to be worse, were more likely to have barriers to physical activity, and indicated lower self-efficacy for physical activity than men (Humpel, 2002). In the US population, 26% of men and 12% of women were engaged in regular physical activity or exercise for at least 30 minutes a day, 5 times a week. There were similar findings in the present study, with 26% of males and 10% of females engaged in walking for 30 minutes a day, 6-7 days a week.

In the current study, the information regarding daily chores of the elderly population were also taken in order to understand their daily schedule. The majority of female participants were housewives who engaged in household chores like cooking, sweeping, mopping the floor, washing clothes and utensils, taking care of grandchildren and family members, reading religious books, watching TV serials, chanting *mantras* (prayers) and chatting with friends. They were also walking for 10-20 minutes, 3-7 days per week, but they were not involved in any activities of moderate or high-intensity and were sedentary for longer periods of time - approximately 337 minutes per day. They preferred to use vehicles for transportation. In most of the studies included in a systematic review, men were found to be more physically active as compared to women. In addition, men were found to be more involved in vigorous physical activities - work-related, transportation or sports-related activities and leisure-time physical activities. In contrast, women were more physically active when it involved household chores/gardening (Notthoff et al, 2017).

Occupation also had a positive association with physical activity. Those who were employed and engaged in occupational activities had higher physical activity levels and were less sedentary. Though employment may not have a strong association with physical activity (Notthoff, 2017), in the present study the female participants were found to be more inactive than the male participants. The majority of the elderly male participants were involved in occupational activities like farming, handling cattle, pottery, wood cutting, tailoring, and labouring in the fields for their livelihood, and the majority of the female participants were engaged in household chores. Older adults are the most sedentary age group, spending 65%-80% of their waking time in sedentary behaviour (Rathi, 2017)

Physical disabilities and chronic diseases which increase with advancing age restrict elderly people's participation in daily activities, social engagements, and leisure activities, making them feel sad, socially isolated, frustrated and dissatisfied with life. They feel they are a burden to their family and have poor quality of life (Singh et al, 2009). In the current study, information regarding their co-morbidities such as hypertension, diabetes etc. was obtained during the physiotherapy assessment and was analysed with respect to their physical activity. The information regarding co-morbidities which was asked during the physiotherapy assessment revealed that, among the 222 inactive participants, 133(69%) had hypertension, 44(20%) had diabetes and 174(78%) had musculo-skeletal conditions. Among the 125 active participants, 40(32%) had hypertension,

13(10%) had diabetes and 61(49%) had musculo-skeletal conditions. Physical activity reduces the risk of cardio-vascular disease, osteoporosis, improves cognitive functioning and overall well-being (Notthoff et al, 2017).

## CONCLUSION

In the current study, the majority of the participants (64%) were physically inactive when measured against the recommendations of the WHO. The female participants were found to be more physically inactive than the male population. This study implies that there is a need to create awareness among the general public regarding the importance of physical activity for healthy aging. More specifically, focused health promotion strategies and interventions should be directed at the elderly population. While the government has an important role to play in educating the society, the physiotherapy profession in particular can play a role in lobbying for the necessary public health interventions and at the same time on a small scale start with the dissemination of information to the elderly population and encourage them to take part in activities which stimulate physical activity and which can be set up by physiotherapists.

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