# Physical Fitness Is Correlated with Quality of Life among Elderly Gymnastics Club from Haji General Hospital Surabaya, Indonesia

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## Abstract

**Background:** Indonesia is the fourth most populated country, of whom 10.8% are elderly people. The quality of life (QOL), which includes physical health, psychological health, social relationships, and the environment, is crucial as physical fitness may reflect the ability to perform daily activities without significant fatigue. The objective of this study was to explore the correlation of physical fitness with the QOL among the elderly.

**Methods:** This was an analytic observational study with a cross-sectional approach, including members of the elderly gymnastics club of the Haji General Hospital Surabaya. The physical fitness value was measured based on $VO_2$max using a 6-minute walk test (6MWT). The $VO_2$max (0.03 x mileage(m) + 3.98 cc/kilogram body weight/minute) was categorized into poor, moderate, and good. The QOL was assessed with WHOQOL-100 and grouped into poor, moderate, and good QOL. Data were analyzed by the Spearman correlation test.

**Results:** In total, 33 elderly were recruited, with an average age was 67.85±6.11 years (range 60–78), mean height was 1.49±0.09 m, mean weight was 57.65±10.53 kg, and mean BMI was 24.92±3.69. The mean $VO_2$max was 16.96±2.37, and the QOL was 64.61±6.82 mL/kg/minute. The 6MWT resulted in the physical fitness of poor (15%; n=5), moderate (36%; n12), and good (48%; n16). The WHOQOL assessment showed moderate (30%; n=10) and good (61%; n=23) QOL. Spearman correlation test results showed a correlation between physical fitness and the QOL (coefficient 0.356 and p= 0.042).

**Conclusions:** There is a correlation between physical fitness and QOL among the elderly, suggesting that increasing physical fitness among the elderly, adjusted to their physical health condition, is important to get a good quality of life.

**Keywords:** Elderly, physical fitness, QOL, gymnastics club, WHOQOL

## Introduction

The aging process occurs progressive and irreversible, often impacting the quality of life (QOL).[1] The Indonesian elderly population in 2021 was 29.3 million people, or equal to 10.8% of its population.[2] The number of elderly people worldwide in 2019 was 703 million, more than children under five years old.[3,4] The aging process affects the body functions, including a decrease in muscle strength and exercise capacity. The elderly often use the limited capacity of their body function to fulfill the activities of daily life (ADL).[5] The elderly are generally physically less active than younger adults. However, the elderly can increase their physical activity, which prevents mortality and increases functional independence.[6] Regular physical activity (PA) improves physiological parameters such as $VO_2$max and muscle strength. Moreover, it also affects mental health, emotional and psychological function, social well-being, and cognitive function improvement.[7]

Physical fitness is the ability of a body to carry out physical activities or to perform daily tasks productively without any limitations or causes excessive fatigue.[8] Physical fitness is strongly related to physical conditions. A good level of physical fitness is that the person can carry out activities for a long time.[9] Physical fitness is one of the important

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factors for carrying out physical activities and sports, which positively impacts cognitive, psychomotor, and affective development.[10] Physical activity and physical fitness are positively related to physical function,[11] and related to the prevention and management of several health-related conditions faced by the elderly.[12] The most commonly used method to evaluate functional capacity is the 6-minute walking test (6MWT).[13] The maximum oxygen ($O_2$) consumption or $VO_2$ max has been defined as the maximum capacity to transport and use oxygen. $VO_2$max is often used to measure an individual's aerobic capacity. Normally, $VO_2$max level decreases gradually with aging, about a 10% decrease rate per decade after 25 years, and 15% over 50 years.[14]

The most important indicators of the health and well-being of the elderly are the quality of life (QOL).[3] According to the World Health Organization (WHO), the QOL could be assessed by person's perception of their position in life, in the context of culture and values in their surrounding environment, as well as with the goals, expectations, standards, and attention of each individu.[15]

There are several instruments of QOL assessment, such as World Health Organization Quality of Life (WHOQOL)-100, WHOQOL-BREF, and WHOQOL-OLD.[15] The WHOQOL is a simple instrument and can be evaluated in all ages. The study of the QOL of the elderly using the WHOQOL-BREF conducted in Indonesia showed that most of the elderly had low quality of life scores on several aspects of each domain, consisting of energy adequacy, ability to carry out ADL, satisfaction with physical capacity, ability to work, ability to concentrate, acceptance of physical appearance, satisfaction with sex life, financially sufficient, information availability, recreational activities, and transportation.[16]

The objective of this study was to determine the correlation of physical fitness with quality of life using WHOQOL-BREF among members of the elderly gymnastics club at Haji General Hospital of Surabaya.

## Methods

This study was an analytical observational study design with a cross-sectional approach. The sampling technique used simple random sampling with a minimum of 33 samples. The elderly aged 60 until 80 years who were members of the elderly gymnastics club of Haji Hospital Surabaya for at least six months and routinely exercised two times a week were included in this study. Elderly people with heart disease and lung disease were excluded from the study. Demographic data such as age, gender, height, and weight were recorded.

$VO_2$max was an indicator of physical fitness. In this study, we used the 6-minute walk submaximal test to measure $VO_2$max with the formula= (0.03 x mileage(m))+3.98 cc/kilogram body weight/minute. In brief, participants walked on a 30 meters track for 6 minutes. After 6 minutes, the distance traveled by the participants was calculated. The result was categorized into poor, moderate, and good, with scores <13.98, 13.98–16.98, and >16.98, respectively.

Whereas the quality-of-life value was obtained using the WHOQOL-BREF assessment instrument questionnaire with 24 items, including four domains physical, psychological, social, and environmental health. WHOQOL-BREF questionnaire was asked to all participants separately before or after the 6-minute walking test was performed. The WHOQOL-BREF questionnaire in this study was performed by interviewing each respondent with the same interviewer to minimize confounding factors.

All respondents in this study were members of routine gymnastics. They voluntarily came to Hajj General Hospital of Surabaya with the assumption that their cognitive function was good, so there was no need to evaluate the MMSE before the WHOQOL-BREF evaluation was carried out.

The quality of life was divided into five categories include very poor (0–20), poor (21–40), moderate (41–60), good (60–80), and very good (80–100). Ethical approval of this study was obtained from the Research Ethics Committee of the Faculty of Medicine, Airlangga University, Surabaya number 142/EC/KEPK/FKUA/2017.

All data was collected using Microsoft Excel, while the statistical analysis was performed using IBM SPSS 24 version. When the data were not distributed normally, the normality test had been employed, so the non-parametric test was performed. We performed the Spearman correlation test to analyze the correlation between physical fitness and QOL.

## Results

In total, 33 elderly people, and members of the elderly gymnastics club at Haji General Hospital Surabaya, were included. The average age was 67.85±6.11 years, ranging from 60 to 78 years. The average height was 1.49±0.09

**Table 1 Characteristics of the Elderly Members of the Gymnastics Club of Haji Hospital Surabaya based on Physical Fitness and Quality of Life**

| | Min | Max | Median | Mean ± SD |
|---|---|---|---|---|
| Age (year) | 60.00 | 78.00 | 67 | 67.85 ± 6.11 |
| Body height (m) | 1.35 | 1.71 | 1.52 | 1.55 ± 0.09 |
| Weight (kg) | 36.00 | 89.00 | 59 | 59.53 ± 10.53 |
| BMI | 16.65 | 32.87 | 23.82 | 24.92 ± 3.69 |
| $VO_2$max (mL/kg/minute) | 11.63 | 20.18 | 17.48 | 16.96 ± 2.37 |
| Quality of Life | 54.50 | 78.00 | 62.75 | 64.61 ± 6.82 |

Note: $VO_2$max was an indicator of physical fitness

**Table 2 Physical Fitness Life of the Elderly Members of the Gymnastics Club of Haji Hospital Surabaya based on Age and Gender**

| | Physical Fitness | | |
|---|---|---|---|
| | Poor | Moderate | Good |
| Age (mean) | 71 | 70.8 | 64.6 |
| Male (n) | 2 | 5 | 4 |
| Female (n) | 3 | 7 | 12 |

Note: $VO_2$max was an indicator of physical fitness. VO2max formula=(0.03 x mileage(m))+3.98 cc/Kilogram body weight/minute with poor, moderate, and good with score <13.98, 13.98-16.98, and >16.98, respectively

m, weight was 57.65±10.53 kg, and BMI was 24.92±3.69. The average Vo2max was 16.96 ± 2.37, and QOL was 64.61±6.82 ml/kg/minute (Table 1).

There was no poor QOL in this study. Of five elderly people with poor physical fitness were 80%; with moderate QOL and 20% with good QOL.

Twelve elderly people with moderate physical fitness were 25% with moderate QOL and 75% with good QOL. While sixteen elderly people had good physical fitness, they were 19% with moderate QOL and 81% had good QOL (Table 2).

The result showed there was a correlation between physical fitness with QOL among the elderly in the elderly gymnastics club of Haji General Hospital Surabaya (p=0.042). However, the correlation coefficient result was 0.356, representing a weak correlation.

**Table 3 Quality of Life of the Elderly Members of Gymnastics Club of Haji Hospital Surabaya, based on Age and Gender**

| | Quality of Life | | |
|---|---|---|---|
| | Poor | Moderate | Good |
| Age (mean) | - | 68.9 | 67.3 |
| Male (n) | - | 3 | 8 |
| Female (n) | - | 7 | 15 |

**Table 4 Correlation between Physical Fitness with Quality of Life**

| Physical Fitness | Quality of Life | | | Total | P-value* |
|---|---|---|---|---|---|
| | Poor | Moderate | Good | | |
| Poor | - | 4 | 1 | 5 | 0.042 |
| Moderate | - | 3 | 9 | 12 | |
| Good | - | 3 | 13 | 16 | |
| Total | - | 10 | 23 | 33 | |

Note: *Statistical analysis using the Spearman correlation test with a significant value of p (<0.05)

## Discussions

$VO_2$max components used in this study are age, gender, weight, height, and distance in the 6MWT. The 6MWT is commonly used to evaluate functional capacity because of its simplicity, ease of interpretation, and ADL representativeness.[5] The average $VO_2$max obtained in this study was 64.6 mL/kg/minute.

A population-based study in China showed the average $VO_2$max among people above 50 years was 36.8±9.2 mL/kg/minute.[17] Similarly, the $VO_2$max among people in another study above 60 years was 39.2 mL/kg/minute in man and 31.1 mL/kg/minute in women.[18] The results of $VO_2$max in this study were higher than other studies. Since they are members of the elderly gymnastics club of Haji General Hospital of Surabaya, who routinely do gymnastics three times a week, leading to a higher $VO_2$max compared to other populations of the same age.

The QOL results show that about one-third had moderate QOL, and two third were good. Interestingly, the elderly in community-dwelling aged from 80 until 93 years in Poland presents a good level of QOL.[1] It is worth noting that the elderly's physical and mental health are the result of their life experiences and the current situation, which is determined by many psychosocial and spiritual factors. Therefore, emotional, spiritual, and cognitive domains need to be included in addition to physical and social health in quality-of-life criteria, indicating that there is a relationship between physical activity and various aspects of QOL.[19]

This study has a significant correlation between Physical Fitness and WHOQOL-BREF. Another study has shown that the superior 6MWT performance participant may be affected by their good QOL in several domains.[13] Interestingly, there is a significant correlation between 6MWT distance and QOL in the elderly.[5] There is a positive assessment of the elderly in QOL domains associated with their physical fitness level, mobility endurance, upper and lower body strength, balance, coordination, and speed.[1] Furthermore, there is a relationship between physical fitness and physical health. Those with poor physical health may not be able to perform tasks productively without fatigue, which also affects the quality of life. A study has identified differences between functional fitness and quality of life among elderly women based on their physical activity levels, which were measured using the Global Recommendations on Physical Activity for Health, showed that older adults who met these physical activity recommendations achieved slightly good in all QOL domains.[20] Quality of life impacts a person's satisfaction in living his/her daily life. The religious or spiritual experience, as well as the cognitive ability, could accept the physical condition and age, or chronic illness suffered, thus allowing them to understand their condition. Our respondents in this study have routinely received knowledge about health and how to maintain physical conditions and improve them whenever it is still possible to improve.

This study shows a weak correlation between QOL and physical fitness; respondents with poor physical fitness have more moderate than good QOL. On the other hand, respondents who have good physical fitness have more good QOL. Interestingly, there is a respondent who has a poor fitness category but with good QOL. By deeper investigation, we found that this respondent is always satisfied with his current condition. He told us that his culture or religion teaches him to always be grateful to God in all circumstances and to always compare with people with worse QOL than himself. Therefore, it is necessary to include spiritual and cognitive elements in the QOL domain.[19]

The limitation of the study is that other domains, such as spirituality, have not been evaluated, which may be affected the quality of life, especially among the elderly. Further study may need to consider this domain.

In conclusion, physical fitness among the elderly is correlated with quality of life, suggesting that physical fitness among the elderly needs to be enhanced, albeit it must be monitored by a physician and adjusted to their physical health conditions to achieve a good quality of life.

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