

## Correlation between Physical Activity Level and Health-Related Quality of Life among Elderly

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### Abstract

**Background:** The elderly population will keep growing in Indonesia. Decreased body function in elderly will affect their health-related quality of life. The aim of this study was to know the correlation between physical activity level and health-related quality of life among elderly

**Methods:** A cross-sectional analytical study was conducted from September to November 2014 in Panti Sosial Tresna Wredha Budi Pertiwi. The level of physical activity was measured with General Practice Physical Activity Questionnaire (GPPAQ) and health-related quality of life using the 36-Item Short Form Health Survey version 2 (SF-36v2). There were 14 out of 29 female elderly who met the inclusion criteria. The data were collected using validated questionnaires and tested with simple linear regression.

**Results:** The physical activity level includes one inactive, three moderately inactives, eight moderately actives, and two actives. The average score of the health-related quality of life was 41.121±8.88 for the physical component scale (below average) and 57.629±7.54 (above average) for the mental component scale. No significant correlation was found between the level of physical activity with the physical component scale (p-value = 0.731) and mental component scale (p-value = 0.901).

**Conclusions:** The most frequently found physical activity level is the moderately active level. The score for the physical component scale is under average, while the mental component scale is above average. There is no correlation between the physical activity level and health-related quality of life for the physical component scale and the mental component scale. [AMJ.2016;3(3):405-10]

**Keywords:** GPPAQ, health-related quality of life, physical activity, SF-36v2

### Introduction

Globally, it is predicted that there will be rapid increase in elderly population growth. In Indonesia, this growth is expected to exceed the Asian and global population after 2050. Act Number 13 year of 1998 on elderly welfare stated that elderly is defined as people 60 years old and over (Ministry of Social Affairs, 2004).<sup>1</sup> Indonesian population census in 1990 showed that the percentage of young people in Indonesia was 36.6 percent, and it is projected to continue declining down to 23.9 percent in 2025, while the elderly population will continue to increase.<sup>1,2</sup> A survey conducted in 2014 showed that there are more elderly women than elderly men. Indonesian life expectancy is increasing every year, in which the average life expectancy for is longer, i.e. 74.88 years, than men, i.e. 69.59 years.<sup>3</sup> Based on previous studies, older women tend to have

a lower health-related quality of life than men in general and are vulnerable to physical and mental disorders.<sup>4,5</sup>

WHO recommendation of physical activity for elderly includes a minimum of 150 minutes of moderate intensity aerobic activity such as brisk walking or yoga, 75 minutes for heavy-intensity aerobic activity such as jogging or running, or a balanced combination for the whole week. Active physical activities will affect the health-related quality of life positively.<sup>6,7</sup> Maintaining health-related quality of life in elderly is one of the main public health issues.<sup>8</sup> This study aimed to reveal the correlation between the level of physical activity and health-related quality of life.

### Methods

A cross-sectional analytical study was conducted from September to November

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2014 in Panti Sosial Tresna Wredha Budi Pertiwi, Bandung, West Java, Indonesia. Data were obtained through two different types of validated questionnaires. To determine the level of physical activity, the General Practice Physical Activity Questionnaire (GPPAQ) was used.<sup>9,10</sup> The GPPAQ has been translated and validated by the researchers in Panti Tresna Werdha Bina Bhakti. To determine the health-related quality of life score, 36-Item Short Form Health Survey version 2 (SF-36v2) was used.<sup>11</sup> The SF-36v2 has been translated and validated by the rheumatology department of Dr. Hasan Sadikin General Hospital. The study was conducted after obtaining the approval from the Health Research Ethics Committee Faculty of Medicine Universitas Padjadjaran.

The population of study includes all residents of Panti Sosial Tresna Wredha Budi Pertiwi. This study used the total sampling technique. The inclusion criteria were women aged 60–74 years, based on the WHO classification age categories for elderly and the age category for GPPAQ, resided in Panti Sosial Tresna Wredha Budi Pertiwi, were still active and able to communicate well, and were able to walk independently without assistance. The exclusion criteria were older women who have any physical disability that made it difficult to move normally (amputee and immobility of limbs), and impaired cognition.

The data collected through the GPPAQ that describe the level of physical activity were entered into a statistical software and divided into four types which were then converted into several nominal scales, i.e. 1 for inactive, 2 for moderately inactive, 3 for moderately active, and 4 for active. Data collected from the SF-36v2 for the health quality of life level

were also entered into the software and were divided into eight scales of measurement, i.e. PF for physical functioning, RP for role-physical, BP for body pain, GH for general health, VT for vitality, SF for social functions, RE for role-emotional, and MH for mental health. From the eight scales, PF, RP, BP, and GH were classified into the physical health scale, while VT, SF, RE, and MH were classified into the mental health scale. The higher the scores are, the better the health-related quality of life. The statistical analysis used to examine the correlation between the two variables was the simple linear regression. The final results of this study were then displayed in tables and graphs and further discussed.

## Results

From the total of 29 respondents, 13 were excluded because their age was >74 years and 2 were excluded because of mental disorder and inability to communicate well resulting in 14 respondents participated in this study. The age of the respondents were grouped into three age groups to facilitate the data processing.

All residents are women. By age group, most of the respondents were 71–74 years old with most of them were elementary school graduates.

The majority of residents had moderately inactive physical activity level. The highest PF score of was found in the age group of 71–74 years while for RP, the highest score was found in the age group of 60–65 years old. The highest BP and GH scores was in the age group of 71–74 years old and the best scores for VT, SF, RE, and MH were found in the age group of 71–74 years old. In general, for both physical

**Table 1 Respondent Characteristics**

Variable	n (14)
Age (years)	
60–65	3
66–70	5
71–74	6
Education Level	
No Formal Education	3
Elementary School	7
Junior High School	3
Senior High School	1

**Table 2 Physical Activity Level**

Age (years)	n	Physical Activity Level			
		Inactive	Moderately Inactive	Moderately Active	Active
60-65	3	0	0	2	1
66-70	5	1	1	2	1
71-74	6	0	2	4	0
Total	14	1	3	8	2

**Table 3 Health-Related Quality of Life Scores**

Age (years)	Health-Related Quality of Life							
	PF Mean (SD)	RP Mean (SD)	BP Mean (SD)	GH Mean (SD)	VT Mean (SD)	SF Mean (SD)	RE Mean (SD)	MH Mean (SD)
60-65	44.4(7.3)	47.1(7.4)	43.1(2.6)	43.4(10.9)	50.0(1.8)	55.0(3.1)	45.5(14.7)	55.6(7.5)
66-70	41.0(9.7)	36.3(13.6)	52.2(9.0)	48(5.8)	56.5(10.7)	48.1(16.6)	48.1(11.0)	56.7(4.3)
71-74	46.8(9.2)	40.6(14.8)	57.4(7.5)	50.0(9.0)	57.8 (5.4)	55.9(2.2)	50.1(14.3)	60.3(5.0)

Note: \*PF: Physical Functioning, RP: Role-Physical, BP: Bodily Pain, GH: General Health, VT: Vitality, SF: Social Function, RE: Role-Emotional, MH: Mental Health

and mental health components, the best scores were mostly found in the age group of 71-74 years compared to other age groups.

The result showed that the age group of 71-74 years old had better scores than the other age groups in both scales.

Based on the Norm-Based Scoring (NBS), the score below 50 is defined as below average or poor. After the summary scale scores for the health-related quality of life physical component scale (PCS) and mental component scale (MCS) grouping was performed, it was revealed that the age group of 71-74 years old had the best scores.

The physical activity levels in the graph were coded into numbers: 1 for inactive, 2 for moderately inactive, 3 for moderately active, and 4 for active. In figure 1A, the correlation between the physical activity level and physical component scale shows a tendency that the higher physical activity level is, the better the physical component scale; thus, it is

directly proportional to the scatter plot graph. After conducting simple regression testing between the two variables, it was revealed that the p-value was 0.731, so no significant correlation between the physical activity level and the physical component scale can be established. The physical activity level and mental component scale were then put into a scatter plot graph as shown in the figure 1B. The figure also shows a straight comparison between the physical activity level and mental component scale. After testing using the simple linear regression, the p-value was 0.901; hence, there is no significant correlation between the physical activity level and mental component scales.

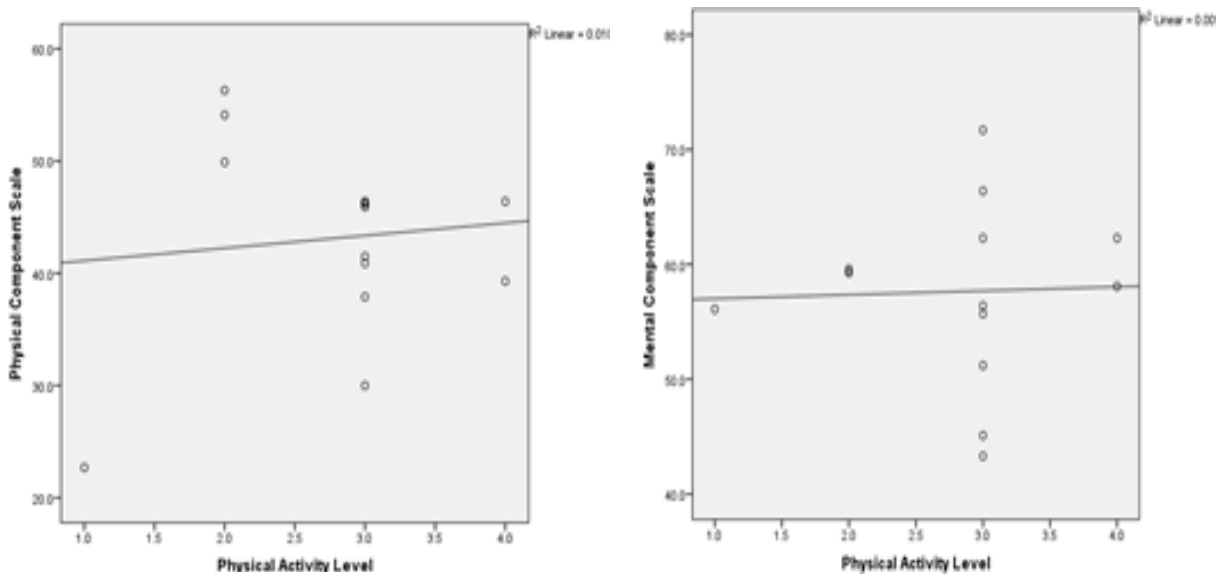
### Discussion

This study shows that in terms of the physical activity level, the majority of respondents are moderately active, as all residents are

**Table 4 Health-Related Quality of Life Scores Summary**

Age (years)	Health-Related Quality of Life Scores	
	PCS Mean (SD)	MCS Mean (SD)
60-65	42.3 (3.5)	54.6 (10.0)
66-70	40.7 (11.0)	57.1 (4.1)
71-74	45.6 (9.5)	59.6 (9.1)

Note: \*PCS: Physical Component Scale, MCS: Mental Component Scale



**Figure 1 Correlation between the Physical Activity Level and Physical Component Scale and Mental Component Scale of Health-Related Quality of Life**

not working or have retired and they are actively involved in regular exercise scheduled twice a week but they never cycle anymore (because GPPAQ scoring focuses on works that involve physical activity, exercise, and cycling throughout a week).<sup>9</sup> There is a regular exercise program of twice a week with a total of two hours of exercise; hence, one hour per session. Most of residents who actively participate in the exercise are in the moderately active group and some of them who add their own exercise schedule into the routine schedule are in the active group. Respondents who exercise independently with a duration that is less than the duration of the weekly routine exercise are categorized into the moderately inactive group while those who never exercise independently and never participate in the routine exercise are categorized into the inactive group. This is in contrast with results from a previous study showing that the majority of physical

activity level performed by the majority of elderly is moderately inactive. This previous study was performed in East Padang on a study population aged  $\geq 60$  years who live in Jati Village of East Padang District.<sup>12</sup> This may be caused by differences in routine physical activities, such as the weekly exercise for elderly conducted by Panti Sosial Tresna Wredha Budi Pertiwi because the respondents of the East Padang study live in their home and do not have routine physical activity.

In the measurement of health-related quality of life, the best score for both component scales are found in the age group of 71–74 years old. This is in contrast with previous studies in Brazil on a population of elderly from four states of Sao Paulo<sup>4</sup> who lived in their house and in Germany<sup>5</sup> on a population of citizens that show that health-related quality of life scores in older respondents decreases. This difference may be caused by environmental

**Table 5 Health-Related Quality of Life Score Grouping by Norm-Based Scoring**

Age (years)	n	Health-Related Quality of Life Scales			
		PCS < 50	MCS < 50	PCS $\geq$ 50	MCS $\geq$ 50
60–65	3	3	1	0	2
66–70	5	5	0	0	5
71–74	6	4	1	2	5
Total	14	12	2	2	12

Note: \*PCS: Physical Component Scale, MCS: Mental Component Scale

factors of the respondents participating in the study, who generally live in their home, have cultural and religious differences, and different races. After the scores are grouped according to the Norm-Based Scoring to simplify the conclusion, the majority of the physical component scale for each age group is under average, which is below 50.0, while the mental component scale is above average. This can be caused by the environmental situation of Panti Sosial Tresna Wredha Budi Pertiwi which allows bias in terms of mental health, as the subjects live together with their peers. This is one of the factors that could influence the mental component scale in accordance with previous studies that showed social activities could improve the mental health of the elderly significantly.<sup>13</sup> A systematic review research also shows that social interventions for health promotion in the elderly who are lonely and isolated elderly will create happiness.<sup>14</sup>

The result regarding the correlation between the physical activity level and health-related quality of life in the physical and mental component scales is not significant. This is in contrast with previous studies that show a significant correlation between a high physical activity level and better health-related quality of life.<sup>15,16</sup> This result was expected because the number of respondents in this study was small and did not represent each group of the study. There was also a tendency for subjective answers on the questionnaire by the respondents, such as they were not able to determine the appropriate response to describe their current condition when they are being interviewed about the health-related quality of life.

There are other limitations in the implementation of this study. This study does not include any medical history details and respondent background that could affect the outcome of the health-related quality of life. The number of respondents in this study is too few and the distribution of data for each group is uneven, allowing for bias and failure in gaining significant correlations between the variables studied. Time constraint is also one of the problems faced during the study. For further research, it is expected to increase the sample size and to include subjects' detailed medical history and background to minimize the possibility of bias and to obtain significant results.

In conclusion, based on the data obtained from the respondents, the highest level of activity in the group is moderately active while the physical component scale is below

the average. The mental component of the respondents is above average. There is no correlation between the physical activity level and health-related quality of life in physical and mental component scales.

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