

THE ASSOCIATION OF PHYSICAL FUNCTIONAL CAPACITY AND SLEEP QUALITY IN THE ELDERLY AT GOTONG ROYONG HOSPITAL

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**THE ASSOCIATION OF PHYSICAL FUNCTIONAL CAPACITY AND SLEEP QUALITY IN
THE ELDERLY AT GOTONG ROYONG HOSPITAL**

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ABSTRACT

Introduction: Old age is a period that indicates a process of physical, mental, and social deterioration over time. There are several things that concern health in old age, one of which is functional status which is a major health problem in the elderly. A person's ability to perform daily activities can be assessed by their functional capacity. Physical functional capacity can be measured using the six-minute walk test (6MWT). There have been many studies that discuss the 6MWT, but none have specifically looked for the relationship between physical functional capacity and sleep quality in the elderly. **Purpose:** This study was conducted with the aim of knowing the relationship between physical functional capacity and sleep quality in the elderly at Gotong Royong Hospital. **Methods:** This study used an analytic observational research design with a cross sectional approach. Data were collected from demographic questionnaires, Pittsburgh Sleep Quality Index (PSQI), and direct 6MWT measurements. Data analysis in this study used univariate and bivariate analysis. **Results:** In this study, the results obtained $p=0.000$ ($p < 0.05$) indicate that there is a significant relationship between physical functional capacity and the quality of sleep of the elderly at Gotong Royong Hospital. **Conclusion:** There is a relationship between physical functional capacity and elderly sleep quality at Gotong Royong Surabaya Hospital.

Keywords: *Physical functional capacity, sleep quality, six-minute walk test, and Pittsburgh Sleep Quality Index.*

ABSTRAK

Pendahuluan: Usia lanjut merupakan suatu periode yang menunjukkan adanya suatu proses kemunduran fisik, mental, dan sosial berdasarkan waktu. Terdapat beberapa hal yang menyangkut kesehatan pada usia lanjut, salah satunya adalah status fungsional yang merupakan masalah kesehatan utama pada lansia. Kemampuan seseorang untuk melakukan aktivitas sehari-hari dapat dinilai dari kapasitas fungsionalnya. Kapasitas fungsional fisik dapat diukur menggunakan six - minute walk test (6MWT). Penelitian yang membahas mengenai 6MWT sudah banyak, namun belum ada yang secara spesifik mencari hubungan antara kapasitas fungsional fisik terhadap kualitas tidur pada lansia. Tujuan: Penelitian ini dilakukan dengan tujuan untuk mengetahui hubungan antara kapasitas

1 fungsional fisik terhadap kualitas tidur pada lansia di RS Gotong Royong. Metode: Penelitian ini menggunakan desain penelitian observasional analitik dengan pendekatan cross sectional. Data diambil dari kuesioner demografi, Pittsburgh Sleep Quality Index (PSQI), dan pengukuran 6MWT secara langsung. 2 Analisis data pada penelitian ini menggunakan analisis univariat dan bivariat. Hasil: Pada penelitian ini didapatkan hasil $p = 0,000$ ($p < 0,05$) yang menandakan bahwa terdapat hubungan yang signifikan antara kapasitas fungsional fisik terhadap kualitas tidur lansia di Rumah Sakit Gotong Royong. Simpulan: Terdapat hubungan antara kapasitas fungsional fisik terhadap kualitas tidur lansia di Rumah Sakit Gotong Royong Surabaya. **Kata Kunci:** Kapasitas fungsional fisik, kualitas tidur, six-minute walk test, dan Pittsburgh Sleep Quality Index.

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INTRODUCTION

The Elderly is a period that shows a process of physical, mental, and social decline based on time. The number of elderly people is increasing along with the high life expectancy. An increase in the elderly population can cause health problems due to the aging process¹. Health problems that often occur in the elderly are sleep disturbances. Research conducted in Iran stated that 86.2% of 390 elderly people with an average age of 60 years and over experienced sleep disturbances and more than half of the elderly needed about 20 minutes to start sleeping². According to the World Health Organization (WHO), in the United States, the prevalence of sleep disorders in the elderly was around 67% in 2010³. In Indonesia, the number of elderly people who experience sleep disorders is 63%⁴.

There are several things related to health

in the elderly, including functional status which is a major health problem in the elderly. The ability of a person to carry out daily activities can be assessed from their functional capacity. If one or more systems have a problem, the functional capacity will be affected.

In the elderly, physical functional capacity is considered poor due to a decrease in the ability to carry out daily activities. In the elderly, physical functional capacity can be measured using the six-minute walking test (6MWT). 6MWT can interpret the approximate mileage and maximum oxygen consumption in a person^{6,9}.

Physical functional capacity is the body's performance using oxygen and is a benchmark in assessing a person's capacity, increasing the intensity of physical activity, and maintaining it. There are several studies regarding functional capacity using 6MWT, but none

have specifically discussed and examined the relationship between physical functional capacity and sleep quality in the elderly. Therefore, based on the background above, I am interested in researching the relationship between physical functional capacity and sleep quality in the elderly at Gotong Royong Hospital.

METHODS

This study used an analytical observational method with a cross sectional design, the sampling technique used non probability sampling, namely by purposive sampling method. This study begins with data collection using a questionnaire to determine physical functional capacity by assessing the Six Minutes Walking Test (6MWT) and sleep quality values using the Pittsburgh Sleep Quality Index (PSQI) that meet the inclusion and exclusion criteria. The data obtained will be analyzed using the Spearman Rank correlation test on the Statistical Product and Service Solution (SPSS) application.

RESULTS

Table 1. General characteristics of respondents.

Characteristics	Frequency	Percentage (%)
Age		
60 – 70 years	76	86,4%
70 – 80 years	12	13,6%
Gender		
Male	33	37,5%
Female	55	62,5%
Physical Functional Capacity		
Good	17	19,3%
Moderate	23	26,1%
Poor	48	54,6%
Sleep Quality		
Good	38	43%
Poor	50	57%
Employed		
Employed	22	25%
- Entrepreneur	10	11,3%
- Security	2	2,4%
- IRT	10	11,3%
Not working	66	75%
Past History of Disease		
Available	35	39,8%
- Hypertension	13	14,8%
- Diabetes Mellitus	10	11,3%

Based on table 1, respondents aged 60-70 years were the respondents with the highest frequency, namely 76 respondents (86.4%), 55 respondents (62.5%) were female, poor physical functional capacity was the highest number, namely 48 respondents (54.6%), the highest frequency of poor sleep quality was 50 respondents (57%). Not working is the most, namely 66 respondents (75%), and 35 respondents (39.8%) have a history of previous illness.

Table 2. Distribution of physical functional capacity by age.

Variabel	Age		
	60 - 70 years (%)	70 - 80 years (%)	Totally (%)
Physical Functional Capacity	Poor	59 (52%)	9 (69%) (54,5%)
	Moderate	20 (27%)	3 (23%) (26,1%)
	Good	10 (21%)	1 (8%) (19,3%)
Totally	75 (100%)	13 (100%)	88 (100%)

Based on table 2, the elderly at Gotong Royong Surabaya Hospital who have poor physical functional capacity get more at the age of 70 - 80 years, namely 69% compared to the age of 60 - 70 years, namely 52%, the elderly who have moderate physical functional capacity get more at the age of 60

- 70 years, namely 27% compared to the age of 70 - 80 years, namely 23%, and the elderly who have good physical functional capacity get more at the age of 60 - 70 years, namely 21% compared to the age of 70 - 80, namely 8%.

Table 3. Distribution of physical functional capacity by gender.

Variabel	Gender			
	Male (%)	Female (%)	Total (%)	
Physical Functional Capacity	Poor	19 (58%)	29 (53%)	48 (54,5%)
	Moderate	13 (39%)	10 (18%)	23 (26,1%)
	Good	1 (3%)	16 (29%)	17 (19,3%)
Total	33 (100%)	55 (100%)	88 (100%)	

Based on table 3, poor physical functional capacity is found more in men, 58% than in women, 53%, in moderate physical functional capacity is found more in men, 39% than women, 18%, and good functional capacity is found more in women 29% than men, 3%.

Table 4. Distribution of sleep quality by age.

Variabel	Age			
	60 - 70 years (%)	70 - 80 years (%)	Total (%)	
Quality of Sleep	Poor	41 (55%)	9 (69%)	50 (57%)
	Good	34 (45%)	4 (31%)	38 (43%)
Total	75 (100%)	13 (100%)	88 (100%)	

Based on table 4, poor sleep quality was found to be more at the age of 70 - 80 years, namely 69% compared to the age of 60 - 70 years old, namely 55%, and in good sleep quality there are more at the age of 60 - 70 years, namely 45% compared to the age of 70 - 80 years, namely 31%.

Table 5. Distribution of sleep quality by gender.

Variabel	Gender			
	Male (%)	Female (%)	Total (%)	
Quality of Sleep	Poor	19 (58%)	31 (56%)	50 (57%)
	Good	14 (42%)	24 (44%)	38 (43%)
Total	33 (100%)	55 (100%)	88 (100%)	

Based on table 5, poor sleep quality was found to be more in men at 58% compared to women at 56%, and in good sleep quality was found to be more in women at 44% than men at 42%.

Table 6. Spearman Rank Statistical Test Results of Physical Functional Capacity on Elderly Sleep Quality at Gotong Royong Surabaya Hospital.

Variabel	Physical Functional Capacity				
	Poor	Moderate	Good	Total	
Quality of Sleep	Poor	40 (45,5%)	5 (5,7%)	5 (5,7%)	50 (57%)
	Good	8 (9%)	18 (20,4%)	12 (13,6%)	38 (43%)
Total	48 (54,5%)	23 (26,1%)	17 (19,3%)	88 (100%)	

Based on table 5.6, elderly people with poor physical functional capacity have poor sleep quality, as many as (45.5%). Elderly who have moderate physical functional capacity have poor sleep quality, as many as (5.7%), and elderly who have good physical functional capacity have poor quality, as many as (5.7%). Then in the elderly with poor physical functional capacity who have good sleep quality, as many as (9%), elderly who have moderate physical functional capacity have good sleep quality, as many as (20.4%), and elderly who have good physical functional capacity have good sleep quality, as many as (13.6%).

DISCUSSION

Respondents aged 60-70 years were the respondents with the most frequency, namely 76 respondents (86.4%), 55 respondents (62.5%) were female, the highest number of poor physical functional capacities was 48 respondents (54.6%), and the frequency of poor sleep quality was also the highest, namely 50 respondents (57%). As many as 66 respondents (75%) did not work, and 35 respondents (39.8%) had a history of previous illness, namely, 13 respondents (14.8%) had a history of hypertension, 10 respondents (11.3%) had a

history of diabetes mellitus, 7 respondents (8%) had a history of hypercholesterolemia, and 5 respondents (5.7%) had a history of falls. The results of the questionnaire analysis show that the elderly who have poor functional capacity can be caused by several factors, namely a history of previous illnesses such as hypertension and diabetes mellitus, and besides that some of them also have a history of falls. When viewed from the questionnaire analysis, poor sleep quality in the elderly is also associated with frequent awakenings at night to go to the bathroom, noise, coughing, and feeling pain or cramps in the body.

In patients with diabetes mellitus there will be a decrease in the quality of sleep, this is because the patient will often wake up at night to urinate and sometimes feel pain or tingling in the hands and feet, causing poor sleep quality¹¹.

In DM patients, glucose will be found in the urine which increases urination (polyuria)¹².

The elderly at the Surabaya Gotong Royong Hospital who have the poorest functional capacity are at the age of 70-80 years (69%).

The decline in the musculoskeletal system in the elderly causes a decrease in flexibility, muscle, and joint strength, decreased cartilage function, and bone density which results in decreased physical ability so that the elderly experience a decrease in their functional capacity¹³. Research conducted by

Potter and Perry said that the higher a person's age, the more physical functional capacity decreases. The elderly who are over 70 years of age have the poor functional capacity¹⁴.

Poor physical functional capacity was found more in men, namely 58%, compared to women, namely 53%. Theoretically in Habut's research, gender differences can affect the physical functional capacity of the elderly. There are differences in physical functional capacity in elderly men when they enter old age. The amount of muscle mass and distribution of fat in men is less than in women because in men the hormone testosterone works more so that it affects protein synthesis which is useful for muscle mass. Bone mass decreases by 10% of peak bone mass at the age of 65 years and 20% at the age of 80 years¹⁵.

Poor sleep quality is found more at the age of 70-80 years, namely 69% compared to the age of 60-70 years, namely 55%.

In the study by Jianfeng Luo et al in China, it was found that out of 1086 respondents, 41.5% of elderly aged 60-80 years and over experienced sleep disturbances¹⁶.

In addition, research conducted by Putu Arysta Dewi showed that out of 15 respondents, 40% of elderly people aged 60-80 years and over had quite poor sleep quality¹⁷.

Poor sleep quality was found more in men, namely 58% compared to women, namely 56%. Research conducted by Astaniah, Rahmayanti, and Setiawan shows that sleep quality is quite poor in men while women have

better sleep quality¹⁸.

The results showed that there was a relationship between physical functional capacity and sleep quality in the elderly at the Gotong Royong Hospital in Surabaya. This is based on the results of statistical tests using the Spearman rank, the calculation results obtained $p - \text{value} = (p < 0.05)$ with a correlation of $r 0.74$, which indicates a strong close relationship. The results of this study are in line with research conducted by Fitri which shows that there is a relationship between physical functional capacity and sleep quality in the elderly with a p-value of 0.005. In addition, research conducted by Fakihan also shows that there is a relationship between physical functional capacity and sleep quality in the elderly with a p-value of 0.007^{19,20}.

CONCLUSIONS

Based on research conducted at Gotong Royong Surabaya Hospital, it can be concluded that there is a significant relationship between physical functional capacity and sleep quality in the elderly.

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