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Evaluating Physical Activity Levels In Patients With Chronic Obstructive Pulmonary Disease At Universitas Airlangga Teaching Hospital Using The International Physical Activity Questionnaire

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) remains a leading cause of global morbidity and mortality, with physical inactivity representing a key determinant of poor outcomes due to airflow limitation, chronic dyspnea, skeletal muscle dysfunction, and systemic inflammation. This descriptive-analytic cross-sectional study evaluated physical activity among 83 COPD patients at Universitas Airlangga Hospital using the International Physical Activity Questionnaire (IPAQ), yielding MET-min/week classifications of low, moderate, and high activity. Results showed that most patients demonstrated low activity levels (65.1%), followed by moderate (27.7%) and high (7.2%), with a mean activity score of 1,489 ± 1,082 MET-min/week. Statistical analysis using Chi-square and Kruskal–Wallis tests indicated no significant association between physical activity level and age ($p = 0.528$) or sex ($p = 0.299$). Overall, COPD patients exhibited predominantly low physical activity regardless of demographic characteristics, underscoring the need for targeted rehabilitation strategies and structured activity programs to improve long-term disease management.

Keywords: COPD, IPAQ, age, gender, physical activity

1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a progressive airway disorder characterized by persistent airflow limitation and chronic inflammatory response to noxious particles or gases, primarily cigarette smoke (1,2). COPD remains a major cause of morbidity and mortality worldwide, with increasing prevalence in aging populations and in countries with high smoking rates (3–5). In Indonesia, the Ministry of Health reports a COPD prevalence of 3.7%, with higher rates in individuals aged ≥40 years (4,14).

Beyond respiratory impairment, COPD significantly reduces functional capacity due to dyspnea, skeletal muscle dysfunction, and decreased exercise tolerance (7,20). Low physical activity is common in COPD

and is strongly associated with exacerbations, hospitalization, and increased all-cause mortality (8,9,21). Conversely, maintaining higher levels of physical activity improves pulmonary function, functional capacity, and quality of life (7,12).

Assessment of physical activity is therefore essential in COPD management. The International Physical Activity Questionnaire (IPAQ) is widely used, validated internationally, and suitable for clinical settings due to its practicality (18). Understanding the physical activity levels of COPD patients, especially in local clinical settings such as Universitas Airlangga Hospital, is important for optimizing rehabilitation strategies and preventing further functional decline.

This study aims to evaluate the physical activity levels of COPD patients at Universitas Airlangga Hospital using the IPAQ and determine their association with age and sex.

2. Methods

This study used a descriptive analytic cross-sectional design (1). The population consisted of COPD patients aged ≥40 years at Universitas Airlangga Hospital, with 83 patients selected through total sampling based on inclusion criteria (1,4). Physical activity was measured using the IPAQ Short Form, and total MET-min/week scores were categorized into low, moderate, and high activity levels (18). Data were analyzed using descriptive statistics, Kruskal–Wallis, and Chi-square tests, with $p < 0.05$ considered significant.

3. Results

A total of 83 COPD patients were enrolled, predominantly older adults, with males comprising the majority—consistent with epidemiological data showing higher COPD prevalence among men (3,4).

Based on IPAQ scoring, 65.1% of patients exhibited low activity, 27.7% moderate activity, and 7.2% high activity. The mean total physical activity level was 1,489 ± 1,082 MET-min/week, indicating generally low physical activity consistent with global COPD trends (8,12).

The Kruskal–Wallis test showed no significant association between age group and physical activity level ($p = 0.528$), while the Chi-square test showed no significant relationship between sex and physical activity ($p = 0.299$). These findings indicate that both age and sex did not significantly influence the physical activity levels of COPD patients, similar to observations in other populations (9,12).

Table 1. Descriptive Distribution of Physical Activity Scores (MET-Minutes/Week)

Type of Activity	*n* (%)	Mean ± SD
Light	54 (65,1)	602 ± 165
Moderate	23 (27,7)	1.874 ± 563
Heavy	6 (7,2)	4.302 ± 502
Total	83 (100)	1.489 ± 1.082

Table 2. Relationship Between Physical Activity Level and Respondents' Age

Age	Light Activity *n*=54 (%)	Moderate Activity *n*=23 (%)	Heavy Activity *n*=6 (%)	Total *n* (%)
25–39	1 (1,2)	2 (2,4)	0 (0)	3 (3,6)

Age	Light Activity *n*=54 (%)	Moderate Activity *n*=23 (%)	Heavy Activity *n*=6 (%)	Total *n* (%)
40–60	35 (42,2)	14 (16,9)	5 (6,0)	54 (65,1)
>60	18 (21,7)	7 (8,4)	1 (1,2)	26 (31,3)

Table 3. Relationship Between Physical Activity Level and Respondents' Gender

Kategori Aktivitas Fisik (IPAQ)	Laki-laki *n*=68 (%)	Perempuan *n* =15 (%)	*p*-value
Ringan	46 (55,4)	8 (9,6)	
Sedang	16 (19,3)	7 (8,4)	
Berat	6 (7,2)	0 (0)	
Total	68 (81,9)	15 (18,1)	0,299

4. Discussion

This study demonstrates that the majority of COPD patients at Universitas Airlangga Hospital exhibit low physical activity levels, aligning with prior studies reporting that COPD markedly limits functional capacity (7–9,21). Factors such as dyspnea, reduced ventilatory function, and skeletal muscle deconditioning contribute significantly to low daily activity in COPD populations (7,20).

The lack of significant association between physical activity and age is consistent with findings that COPD severity, symptoms, and comorbidities often play a larger role than chronological age in determining activity levels (9,12). Similarly, no significant relationship was observed between sex and physical activity. Although men may exhibit higher baseline activity in the general population, COPD appears to exert a uniform limiting effect on both sexes (10,12).

Given the strong evidence linking low physical activity to increased mortality, exacerbations, and reduced quality of life (8,21), these findings highlight the urgent need for structured pulmonary rehabilitation programs. Such programs—recognized internationally by ATS and ERS—can significantly improve functional capacity, reduce symptoms, and enhance overall quality of life in COPD patients (7,22).

5. Limitation

This study has limitations. Its cross-sectional design does not allow causal inference between demographic factors and physical activity (1). Physical activity was measured using a self-reported questionnaire (IPAQ), which may introduce recall bias (18). Additionally, clinical variables such as FEV_1, BMI, comorbidities, or exacerbation frequency were not analyzed, though these factors are known to influence physical activity levels (8,11,21).

6. Conclusion

Most COPD patients at Universitas Airlangga Hospital exhibit low physical activity levels, consistent with previous literature (8,9,21). No significant associations were found between activity level and age or sex. These findings underscore the need for enhanced physical activity promotion and the implementation of pulmonary rehabilitation programs to prevent further functional decline (7,22).

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