Original Article

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Physical Activity Levels Based on Indonesian Population Characteristics: Evidence from the Indonesian Family Life Survey-5

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Abstract

Background: According to the World Health Organization, approximately 80% of the global population is physically inactive. Sedentary behavior is a major contributor to the increasing risk of chronic diseases. This study aimed to describe physical activity levels among the Indonesian population and examine their associations with sociodemographic and lifestyle factors.

Methods: This cross-sectional study was conducted from March to November 2024 using secondary data from the Indonesian Family Life Survey-5 (IFLS-5). Variables analyzed included age, gender, ethnicity, marital status, body mass index (BMI), perceived health status, occupation, education level, residence, sleep quality, smoking status, and physical activity level. A total of 4,156 respondents were included. Associations between population characteristics and physical activity levels were examined using the chi-square test.

Results: Nearly half of the respondents engaged in light physical activity (47.8%), followed by moderate (28.0%) and vigorous physical activity (24.2%). Significant associations were found between physical activity levels and age (p=0.015), gender (p<0.001), ethnicity (p=0.006), occupation (p<0.001), education level (p<0.001), residence (p<0.001), sleep quality (p<0.001), and smoking status (p<0.001). Agricultural workers (46.7%) and individuals with severe sleep disturbances (40.0%) were more likely to engage in vigorous physical activity.

Conclusions: Most Indonesians engage predominantly in light physical activity. Several sociodemographic and lifestyle factors are significantly associated with physical activity levels, underscoring the importance of promoting healthier and more active lifestyles.

Keywords: IFLS-5, lifestyle factors, physical activity, sedentary behavior

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Introduction

Physical activity is a crucial component for maintaining a healthy and fit body, particularly in reducing the risk of chronic diseases and mortality, controlling body weight, and boosting self-confidence. According to the World Health Organization, only 80% of adults engage in sufficient physical activity, which is defined as a minimum of 150 minutes of moderate or vigorous physical activity per week.[1] In Indonesia, 33.5% of individuals aged over 10 years do not meet the recommended level of physical activity.[2] One of the primary causes of physical inactivity is a sedentary lifestyle, which is lack of body movement. Technological advancements have been linked to an increased risk of sedentary behavior, which may contribute to obesity and other metabolic disorders.[3]

Physical activity can be measured using the Metabolic Equivalent of Task (MET). This instrument measures physical activity level based on its intensity, which is classified into three levels: light, moderate, and vigorous.[4] A previous study has found that physical activity

levels increase in individuals of productive age, males, unmarried individuals, those in good health, and those living in rural areas.[5] On the other hand, physical activity decreases in individuals from ethnic minorities, those with a high BMI, those of low socioeconomic status, those who engage in sedentary activities, and those with poor lifestyles, such as poor sleep quality, smoking habits, and alcohol consumption.[6,7]

Although numerous studies have explored the factors influencing physical activity levels, there remains a lack of research on physical activity levels in Indonesia. This study aimed to describe physical activity levels among the Indonesian population based on sociodemographic, socioeconomic, and lifestyle factors using IFLS-5 data.

Methods

This cross-sectional analytical study was conducted from March to November 2024 using secondary data from the 5th Indonesian Family Life Survey (IFLS-5), a longitudinal survey conducted between October 2014 and April 2015 in 13 provinces in Indonesia. These provinces included North Sumatra, West Sumatra, South Sumatra, Lampung, Bangka Belitung Islands, Banten, DKI Jakarta, West Java, DI Yogyakarta, Central Java, East Java, Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi. The IFLS-5 was a survey that collects data on economic, health, and educational aspects from 31,000 households, providing a comprehensive socioeconomic data and served as a representative of Indonesia's demographic.[8] However, IFLS-5 survey was based on self-reported data, therefore, the potential for reporting bias should be taken into account. The research obtained ethical approval from the Health Research Ethics Committee, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia (No. 03/09/KEP-FKIKUAJ/2024).

Eligible participants were individuals aged ≥15 years, not pregnant, and did not have physical or mental disabilities limiting physical activity. After data cleaning, 4,156 respondents were included from the initial samples of 31,439 respondents.

A total of 13 variables were analyzed, including sociodemographic, socioeconomic, and lifestyle factors, which are age, gender, ethnicity, marital status, body mass index (BMI), observed health status, occupation, income, highest education level, residency, sleep quality, smoking habits, and physical activity levels.

Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ). Respondents reported the frequency and duration of physical activities performed in the previous week. Metabolic Equivalent of Task (MET) scores were calculated and categorized into three levels: light, moderate, and vigorous activity. The association between physical activity and individual characteristics were examined using the chi-square test, and the results were summarized in tables.

Results

Of the 4,156 respondents included in the analysis, the majority were adults (90.2%), male (62.5%), of Javanese ethnicity (45.0%), married (69.3%). Most participants had a normal BMI (45.5%) and reported normal perceived health status (94.8%). More than half were private-sector employees (53.6%), had below-average income (64.0%), graduated from high school (41.1%), and lived in urban areas (63.2%) as depicted in Table 1.

Regarding lifestyle factors, most respondents reported mild sleep disturbances (59.6%), were non-smoker (54.9%), and engaged in light physical activity (47.8%) (Table 2). There were significant associations observed between physical activity levels and age group ($p=0.015$), gender ($p<0.001$), and ethnicity ($p=0.006$). Among the elderly, the majority (37.0%) were found to engage in moderate physical activity. Women were also found to be more likely to engage in light physical activity compared to men (56.2% vs 42.8%). Individuals from Sulawesi (55.8%) and the Batak ethnicity (53.3%) showed the highest proportion of light activity. In contrast, marital status ($p=0.144$) and BMI ($p=0.170$) were not significantly associated with physical activity levels (Table 3).

Bivariate analysis showed that occupation ($p<0.001$), education level ($p<0.001$), and residency ($p<0.001$) were significantly associated with physical activity levels. Agricultural workers were found to be more likely to engage in vigorous physical activity (46.7%), whereas government employees predominantly engaged in light physical activity (54.8%). Individuals with higher education also had the highest proportion of light physical activity. Urban residents were more likely to engage in light activity compared to rural residents (50.9% vs 42.5%), whereas rural residents demonstrated a highest proportion of light physical activity (58.9%)

Table 1 Characteristics of Data Respondents from the 5th Indonesian Family Life Survey (IFLS-5) (n= 4,156)

Variables	Median	Range	n	%
Sociodemographic factors				
Age group (years)	**28**	15–77		
Young			363	8.7
Adult			3,747	90.2
Elderly			46	1.1
Gender				
Female			1,560	37.5
Male			2,596	62.5
Ethnicity				
Javanese			1,872	45.0
Sundanese			475	11.4
Batak			242	5.8
Sulawesi			308	7.4
Madurese			89	2.1
Others			1,170	28.2
Marital status				
Unmarried			1,160	27.9
Married			2,882	69.3
Divorced/separated			88	2.1
Widowed			26	0.6
. Body mass index (BMI)	21.87	13.62 - 45.78		
Underweight			573	13.8
Normal			1,889	45.5
Overweight			589	14.2
Obese			1,105	26.6
Socioeconomic factors				
Health status				
Poor			58	1.4
Normal			3,939	94.8
Good			159	3.8
Occupation				
Family worker			242	5.8
Self-employed			738	17.8
Government worker			367	8.8
Private worker			2,229	53.6
Freelance agricultural worker			150	3.6
Others			430	10.3
Income (Rupiah)	500,000	0–28,000,000		
Mean (767,943 ± 1,002,489)				
Above or same as average			1,497	36.0
Below average			2,659	64.0
Highest education level				
Elementary school			809	19.5
Junior high school			911	21.9
Senior high school			1,710	41.1
Undergraduate/diploma			718	17.3
Other			8	0.2
Residence				
Urban			2,625	63.2
Rural			1,531	36.8
Total			4,156	100

Table 2 Lifestyle Factors of Respondents from the 5th Indonesian Family Life Survey (IFLS-5)

Variables	n	%
Sleep Quality		
No sleep disturbance	960	23.1
Mild sleep disturbance	2,477	59.6
Moderate sleep disturbance	689	16.6
Severe sleep disturbance	30	0.7
Smoking Status		
Yes	1,876	45.1
No	2,280	54.9
Physical Activity Level		
Light	1,987	47.8
Moderate	1,005	24.2
Vigorous	1,164	28.0
Total	4,156	100

Health status (p=0.833) and income level (p=0.355) were not significantly associated with physical activity level (Table 4).

Sleep quality and smoking habits were significantly associated with physical activity levels (p<0.001). Individuals with severe sleep disturbances were more likely to engage in vigorous activity (40.0%), while those without sleep problems were predominantly engaged in light activity (54.9%). Non-smokers also engaged in more light activity compared to smokers (52.9% vs 41.6%), whereas smokers had a higher participation in vigorous activity (34.4%) (Table 5).

Table 3 Physical Activity Level Based on Respondents' Sociodemographic Factors

Sociodemographic Factor	Physical Activity Level						p-value
	Light		Moderate		Vigorous		
	n	%	n	%	n	%	
Age group							0.015*
Young	170	46.8	106	29.2	87	24.0	
Adults	1,802	48.1	882	23.5	1063	28.4	
Elderly	15	32.6	17	37.0	14	30.4	
Gender							0.000*
Female	877	56.2	371	23.8	312	20.0	
Male	1,110	42.8	634	24.4	852	32.8	
Ethnicity							0.006*
Javanese	861	46.0	440	23.5	571	30.5	
Sundanese	217	45.7	132	27.8	126	26.5	
Batak	129	53.3	56	23.1	57	23.6	
Sulawesi	172	55.8	67	21.8	69	22.4	
Madurese	40	44.9	18	20.2	31	34.8	
Other	568	48.5	292	25.0	310	26.5	
Marital status							0.144
Unmarried	563	48.6	286	24.7	311	26.8	
Married	1,369	47.5	682	23.7	831	28.8	
Divorced/separated	45	50.6	28	31.5	16	18.0	
Widowed	10	38.5	10	38.5	6	23.1	
BMI							0.170
Underweight	275	48.0	125	21.8	173	30.2	
Normal	882	46.7	459	24.3	548	29.0	
Overweight	273	46.3	151	25.6	165	28.0	
Obese	557	50.4	270	24.4	278	25.2	

Table 4 Physical Activity Level Based on Respondents' Socioeconomic Factors

Socioeconomic Factors	Physical Activity Level						p-value
	Light		Moderate		Vigorous		
	n	%	n	%	n	%	
Health status							0.833
Poor	25	43.1	15	25.9	18	31.0	
Normal	1,880	47.7	955	24.2	1,104	28.0	
Good	82	51.6	35	22.0	42	26.4	
Occupation							0.000*
Family worker	117	48.3	66	27.3	59	24.4	
Self-employed	333	45.1	202	27.4	203	27.5	
Government worker	201	54.8	80	21.8	86	23.4	
Private worker	1,115	50.0	517	23.2	597	26.8	
Freelance agricultural worker	48	32.0	32	21.3	70	46.7	
Others	173	40.2	108	25.1	149	34.7	
Income							0.355
Above or same as average	736	49.2	346	23.1	415	27.7	
Below average	1,251	47.0	659	24.8	749	28.2	
Highest education level							0.000*
Elementary school	317	39.2	219	27.1	273	33.7	
Junior high school	393	43.1	232	25.5	286	31.4	
Senior high school	849	49.6	397	23.2	464	27.1	
Undergraduate/diploma	423	58.9	155	21.6	140	19.5	
Other	5	62.5	2	25.0	1	12.5	
Residence							0.000*
Urban	1,336	50.9	628	23.9	661	25.2	
Rural	651	42.5	377	24.6	503	32.9	

Discussion

This study has found that most respondents engaged in light physical activity, except for agricultural workers and individuals with sleep disturbances, who were more likely to perform vigorous activity. The 2018 Indonesian Basic Health Research Report (*Riskesdas*) reported that 66.5% of the Indonesian population engaged in sufficient physical activity.[2] Using the same criteria, 52.2% of respondents in this study has been found to engage in sufficient physical activity. This difference may be attributed to the sample size and the subject criteria in Riskesdas, which are over 800.00 samples and aged 10 years and above, respectively.

In this current study, the most respondents across various age groups have been engaged in light physical activity, although most of the elderly engaged in moderate activity. This contradicts the previous research findings that reported young people and adults who typically exhibit higher levels of physical activity compared to others.[9] This can be explained by the increasing trend of

Table 5 Physical Activity Level Based on Respondents' Lifestyle Factors

Lifestyle Factors	Physical Activity Level						p-value
	Light		Moderate		Vigorous		
	n	%	n	%	n	%	
Sleep quality							0.000*
No sleep disturbance	527	54.9	209	21.8	224	23.3	
Mild sleep disturbance	1,156	46.7	617	24.9	704	28.4	
Moderate sleep disturbance	293	42.5	172	25.0	224	32.5	
Severe sleep disturbance	11	36.7	7	23.3	12	40.0	
Smoking status							0.000*
Yes	781	41.6	449	23.9	646	34.4	
No	1,206	52.9	556	24.4	518	22.7	

a sedentary lifestyle among young people, driven by technological advancements. A national survey in Australia revealed a decline in physical activity among adults, with 77.6% failing to meet the recommended levels of physical activity.[10] Technology has replaced human involvement in daily tasks, such as transportation and household chores, resulting in a decrease in physical activity. Additionally, younger age groups are more inclined to use technology during leisure time, which further reduces their physical activity levels.[11]

Sex differences were signifivantly associated with physical activity levels. Women were more likely to engage in light physical activity, whereas men participated more frequently in vigorous activity. These differences may be explained by variations in physiological factors, hormonal influences, and motivational patterns. Additionally, men tend to be more competitive and have higher motivation than women, which explains why women are generally less active.[13]

Interestingly, this study shows that ethnicity is associated with physical activity levels. This finding is consistent with a previous study conducted in the United States, reporting that the beliefs and habits of each group influence differences in physical activity levels between ethnic groups.[14] Additionally, there has not been a study on the relationship between physical activity levels and ethnic groups in Indonesia yet, which suggests future research to explore how varying levels of physical activity may differ across ethnic groups in Indonesia.

No association was observed between marital status and physical activity levels. Although, previous studies have suggested that marriage may reduce activity levels due to increased responsibilities and reduced leisure time, such patterns were not evident in this population. One contributing factor to this phenomenon is that married individuals typically have less free time due to increased household responsibilities or higher work demands to earn a living, which explains why the majority of physical activity is of a light nature.[15] On the other hand, the decline in physical activity levels among unmarried individuals can be explained by psychological factors, particularly the lack of social support. The perceptions of physical activity are closely related to both internal and social norms within an individual's environment.[16] The negative social norms about physical activity have a stronger influence than positive norms, making some individuals more reluctant to engage in physical activity.[16,17]

Body mass index was not significantly associated with physical activity levels in this study. This finding contrasts with previous research reporting that an increase in body fat mass is associated with a decrease in physical activity. Body fat mass is also related to lower physical activity levels because it requires more energy and time to move, making obesity a barrier to vigorous physical activity.[18–20]

Health status did not correlate with physical activity levels in this study. Individuals with chronic diseases engage in less physical activity than healthy individuals. Chronic disease can reduce physical fitness, such as decreased cardiopulmonary function and musculoskeletal dysfunction.[21]

Another factor is occupation that is linked to physical activity levels, with individuals working in agriculture being more likely to participate in vigorous activity. Office workers typically do not require physical exertion, and most of their work is done using computers, which may lead to prolonged sitting. Office workers spend an average of nine hours sitting during their workday. Long working hours limit employees' leisure time, leaving them with insufficient time for moderate or vigorous physical activity outside of work hours.[22] The high levels of vigorous physical activity among agricultural workers can be explained by the nature of their work, which requires physical labor.

Income level was not significantly associated with activity levels; however, education and residence showed significant relationships. Individuals with low socioeconomic status are more likely to lack access to physical activity facilities and have lower health knowledge and awareness, which makes them more prone to sedentary behavior. Moreover, greater work-related stress contributes to fatigue, making physical activity seem like an additional burden.[23] On the other hand, individuals with higher socioeconomic status have greater access to technology, leading to increased sedentary behavior. The use of screen devices further encourages prolonged periods of sedentary behavior.[24] Moreover, individuals with higher socioeconomic status often employ others to perform household chores. Additionally, they typically use private vehicles for transportation, which contributes to reduced physical activity levels.[25]

Sleep quality has been found to correlate with physical activity levels, with individuals who predominantly engage in vigorous physical activity having severe sleep disturbances. This

finding is consistent with a study conducted in Saudi Arabia, showing that poor sleep quality is associated with decreased physical activity levels due to excessive energy expenditure during the night.[26] Increased physical activity levels among individuals with severe sleep disturbances may indicate efforts to address sleep issues through physical activity. Regular physical activity has been found to positively affect sleep disturbances and insomnia by improving relaxation, regulating circadian rhythms, and body temperature, all of which contribute to sleep.[27]

Smoking was also significantly associated with physical activity. Smokers were more likely to engage in vigorous activity compared to non-smokers. However, smoking is known to increase oxidative stress, impair mitochondrial function, and reduce cardiopulmonary capacity, potentially limiting long-term physical performance. Smoking can lower physical fitness, especially in terms of cardiopulmonary function and muscle endurance, acting as a barrier to engaging in higher levels of physical activity.[28]

The limitations of this study include the uneven distribution of data, with most respondents being office workers and from lower socioeconomic groups, which reduces the representativeness of the sample. Moreover, since the study relies on secondary data, it cannot include additional variables, thus restricting the scope of the analysis.

In conclusion, most Indonesians predominantly engage in light physical activity, reflecting the growing influence of sedentary behavior. Individuals working in agriculture and those with severe sleep disturbances are more likely to engage in vigorous physical activity.

Physical activity levels were significantly associated with age, sex, ethnicity, occupation, education level, residence, sleep quality, and smoking status. Therefore, it is recommended that public health campaigns should be widely initiated to educate the public about the importance of physical activity, and the associated risks of sedentary behavior.

It is also recommended to increase public facilities for physical activity in both urban and rural areas, including wider access to such facilities, as well as in offices, to reduce sitting time for office workers. This study emphasizes the importance of adopting a healthy lifestyle to prevent chronic diseases and improve overall well-being at all ages by identifying individual risk factors based on personal characteristics. This study also highlights the need to develop more effective public health policies and programs that promote the benefits of physical activity for the community.

Authors' Contributions

GF and FK conceptualized and designed the study. GF, FK, and YA were responsible for data acquisition. GF, KK, and YA performed the statistical analysis and interpreted the results. GF drafted the manuscript, while FK, KK, and BTS critically revised it. All authors reviewed and approved the final manuscript.

Conflict of Interest

The authors declare no conflict of interest.

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Conflict of Interest

The authors used generative AI tools only for language editing and improving manuscript clarity. All scientific content and interpretations are the responsibility of the authors.

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