

The Relationship between Socio-Demographics, Knowledge, and Attitude with Physical Activity in the Productive Age Community in Padang City, West Sumatra, Indonesia



Abdiana¹ , Masrul^{2,*} , Hardisman³ , Najirman⁴ , Rizanda Machmud³ , Firdawati³ , Yantri Maputra⁵ , and Musfardi Rustam⁶ 

¹Doctoral Program in Public Health, Faculty of Medicine, Andalas University, Padang, West Sumatra 25127, Indonesia

²Department of Nutritional Sciences, Faculty of Medicine, Andalas University, Padang, West Sumatra 25127, Indonesia

³Department of Public Health-Community Medicine, Faculty of Medicine, Andalas University, Padang, West Sumatra 25127, Indonesia

⁴Department of Internal Medicine, Faculty of Medicine, Andalas University, Padang, West Sumatra 25129, Indonesia

⁵Department of Psychology, Faculty of Medicine, Andalas University, Padang, West Sumatra 25127, Indonesia

⁶Faculty of Nursing, University of Riau 28121, Indonesia

Abstract:

Introduction: Lack of physical activity is a significant risk factor for various noncommunicable diseases and a cause of global death. National data from Indonesia shows that the prevalence of a lack of physical activity is 33.5%, while in West Sumatra Province, the figure is higher, at 39.4%. This condition requires targeted intervention by understanding the distribution of physical activity based on the community's sociodemographic characteristics, knowledge, and attitudes. This research aims to analyze the relationship between sociodemographic factors, knowledge, attitudes, and the level of physical activity in the productive age community.

Methods: A cross-sectional analytical study was conducted on 316 productive-age respondents selected using cluster random sampling. Data were collected using a structured questionnaire and analyzed using the Chi-square test for bivariate analysis and logistic regression for multivariate analysis to determine the dominant factors influencing physical activity.

Results: As many as 37.0% of respondents had low physical activity, higher than moderate (36.1%) and high (26.9%) physical activity. The most influential factors on low physical activity were gender ($p=0.00$; OR=0.02), occupation ($p=0.002$; OR=4.02), knowledge ($p=0.000$; OR=24.72), and attitude ($p=0.000$; OR=25.83). Meanwhile, for moderate physical activity, the dominant factors were gender ($p=0.000$; OR=0.185), occupation ($p=0.028$; OR=2.15), knowledge ($p=0.031$; OR=2.89), and attitude ($p=0.028$; OR=2.78).

Discussion: These results indicate that physical activity among productive-age individuals is influenced by gender, occupation, and individual knowledge and attitudes toward health. Improving access to accurate health information is key to promoting active lifestyles. These findings underscore the importance of integrating health education programs to empower communities to increase physical activity levels effectively.

Conclusion: Physical activity in the productive age is influenced by gender, type of employment, and knowledge and attitudes toward health. Gender-based health education interventions and increased access to accurate health information are key to promoting active lifestyles and effectively empowering communities to reduce the risk of non-communicable diseases.

Keywords: Socio demographics, Knowledge, Attitudes, Physical activity, Prevention, Noncommunicable diseases, Productive age.

© 2025 The Author(s). Published by Bentham Open.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: <https://creativecommons.org/licenses/by/4.0/legalcode>. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



Received: May 28, 2025

Revised: July 04, 2025

Accepted: July 08, 2025

Published: October 09, 2025



Send Orders for Reprints to
reprints@benthamscience.net

*Address correspondence to this author at the Doctoral Program in Public Health Department, Faculty of Medicine, Universitas Andalas, West Sumatra, Indonesia; E-mail: masrulumuchtar@med.unand.ac.id

Cite as: Abdiana , Masrul , Hardisman , Najirman , Machmud R, Firdawati , Maputra Y, Rustam M. The Relationship between Socio-Demographics, Knowledge, and Attitude with Physical Activity in the Productive Age Community in Padang City, West Sumatra, Indonesia. *Open Public Health J*, 2025; 18: e18749445412309.
<http://dx.doi.org/10.2174/0118749445412309250930073847>

1. INTRODUCTION

Physical activity plays an important role in the prevention and control of Noncommunicable Diseases (NCDs) such as hypertension, obesity, type 2 diabetes mellitus, cardiovascular disease, and some types of cancer. Adequate physical activity also improves mental health, cognitive function, and overall quality of life [1]. Conversely, lack of physical activity is one of the main risk factors for global mortality. Of all deaths from noncommunicable diseases, 73% occur in low- and middle-income countries [2, 3].

Physical activity includes various forms of body movement that involve energy expenditure, whether performed at work, during activities at home, during leisure time, or through planned, structured, and repeated physical exercise, such as sports. In practice, each individual has a different level of physical activity, depending on lifestyle, environmental conditions, and various personal and social factors [4, 5].

The World Health Organization (WHO) recommends that adults engage in at least 150–300 minutes of moderate-intensity physical activity per week. However, globally, around 31% of adults and 80% of adolescents have not reached the recommended level of physical activity. The global target is to reduce physical inactivity by 10% by 2025 and 15% by 2030 [6]. In Indonesia, only 32.83% of the population is classified as active in sports or physical activity, with a significant gap between men (35.7%) and women (21.4%) [7]. In West Sumatra Province, the prevalence of physical activity reached 39.4%, higher than the national figure of 33.5% [8]. This condition indicates the need for serious attention to the physical activity patterns of the community, especially in the productive age group (15–59 years), which is the backbone of national development.

Various factors, including socio-demographic factors, influence the level of physical activity. Research indicates that men tend to engage in higher levels of physical activity than women. Additionally, unemployed individuals are less likely to be educated, which also plays a significant role, as low education levels correlate with lower levels of physical activity [9]. Education also plays a significant role, where low education levels correlate with lower levels of physical activity [10]. Marital status or living in a couple is also associated with increased physical activity [11]. Likewise, low levels of physical activity are primarily found in individuals with low levels of knowledge compared to those with moderate to good knowledge [12].

According to the Theory of Planned Behavior, socio-demographic factors such as age, gender, education, occupation, knowledge, and attitudes can influence attitudes, subjective norms, and perceived behavioral control toward physical activity. Good knowledge enhances an individual's understanding of the benefits of physical activity, which in turn fosters a positive attitude. This positive attitude strengthens the intention and, together with perceived behavioral control, encourages individuals to do physical activity consistently [13, 14].

In the context of local culture, especially in West Sumatra, which adheres to a matrilineal customary system, gender roles influence physical activity patterns. Women generally carry out more domestic activities at home, while men are more active outside the home due to their involvement in social, economic, and community activities. This pattern can impact the level of daily physical activity, which varies between genders. There is a relationship between gender and physical activity [15]. On the other hand, knowledge and attitudes towards the importance of physical activity also play an important role. Sujarwati's study found a significant relationship between knowledge and physical activity behavior, indicating that those who have knowledge are more likely to be physically active [16].

The relationship between socio-demographics and physical activity is not always consistent. Several studies have found that education level and knowledge did not significantly influence physical activity habits, depending on population characteristics and social environment [12, 16]. Therefore, this study is important to identify productive age groups that are at low risk of performing physical activity. By understanding the relationship between sociodemographic factors, knowledge, and attitudes with physical activity, interventions can be directed more effectively. The results of this study are expected to serve as the basis for developing health promotion programs and supporting evidence-based public policies aimed at improving public health.

2. MATERIALS AND METHODS

2.1. Study Design

This research is a quantitative study with a cross-sectional study approach. This design was chosen to simultaneously identify the relationship between independent variables (sociodemographic, knowledge, and attitude) and dependent variables (physical activity). This study uses a cross-sectional design because it is considered

the most appropriate for studying the relationship between factors to provide a comprehensive picture of the current population condition and be efficient in terms of time and resources.

2.2. Study Location

The research was conducted in Padang City, West Sumatra, namely in the working area of the Ikur Koto Health Center, the working area of the Ulak Karang Health Center, and the working area of the Rawang Health Center.

2.3. Population and Sample

2.3.1. Research Population

The research population consists of all individuals aged 15-59 years in the working area of the Ikur Koto, Ulak Karang, and Rawang Health Centers in Padang City in 2024.

2.3.2. Research Sample

A sample is a part of the population's number and characteristics. The research sample consists of the community aged 15-59 years in the working area of the three Health Centers in Padang City in 2024, who meet the inclusion and exclusion criteria. The inclusion criteria for the research sample were willingness to participate (signing informed consent) and cooperation during data collection. The exclusion criteria included incomplete data on the variables studied (missing values) and respondents who were unable to complete the questionnaire correctly.

$$n = \frac{\{Z_{1-\frac{\alpha}{2}}\sqrt{2P(1-P)} + Z_{1-\beta}\sqrt{P_1(1-P_1)+P_2(1-P_2)}\}^2}{(P_1-P_2)^2}$$

where,

$Z_{1-\alpha/2}$ = Z value at confidence interval (two-tailed hypothesis test) = 1.96.

$Z_{1-\beta}$ = Z value on test power = 80%

P_1 = 0,679 [17]

P_2 = 0,419 [17]

p = $P_1+P_2/2$

Based on the sample formula, the minimum sample size is 316.

2.3.2.1. Inclusion Criteria

Inclusion criteria were:

1) Aged 15-59 years, according to the definition of productive age in the minimum health service standards based on the regulations of the Indonesian Minister of Health [18].

2) Residing or working in the work area of the health center being studied.

3) Able to read and write, to ensure that they can fill out the questionnaire independently or understand the questions well.

4) Willing to be a respondent by signing an informed consent.

5) Not currently sick during data collection.

2.3.2.2. Exclusion Criteria

The exclusion criteria were incomplete data found in the variables studied.

The sampling technique used was tcluster random sampling, and 3 health centers were selected from 24 health centers in Padang City, namely the Ikur Koto Health Center, the Ulak Karang Health Center, and the Rawang Health Center. The selection was made considering regional representation, with one health center located in the city center, one in the suburbs, and one in the coastal area.

2.4. Data Collection

Data collection in this study was conducted through face-to-face interviews using structured questionnaires containing all research variables (age, gender, education, occupation, marital status, knowledge, attitudes, and physical activity). The interviews were conducted by five enumerators with undergraduate health education backgrounds. To ensure the quality and consistency of the data obtained, the researchers conducted training and shared perceptions with all enumerators before the data collection process began. The training included an in-depth understanding of all the questions in the questionnaire. The GPAQ questionnaire, in particular, is related to the dimensions of activity intensity, duration, and frequency of physical activity. Enumerators were also given interview simulations to practice delivering questions uniformly, as well as to estimate the ideal duration of interviews per respondent, to avoid respondent saturation, which could affect the quality of answers.

Before data collection was conducted on the research sample, a pilot test was carried out on 30 individuals from the target population who were not included in the research sample. This trial aimed to evaluate item clarity, language comprehension, and interview time estimation and identify potential systematic bias. The interview process was conducted in a comfortable, quiet, and distraction-free environment to minimize recall bias. To detect potential inconsistencies in answers, the enumerator repeated several questions with different wording as a form of internal validation.

2.5. Research Instruments: Validity and Reliability of Test

The research instruments are the tools that will be used for data collection. The research instruments used include knowledge and attitude questionnaires, as well as physical activity assessments. The knowledge variable questionnaire consists of 15 questions. The attitude variable questionnaire consists of 7 questions. The physical activity questionnaire uses the Global Physical Activity Questionnaire (GPAQ), which consists of 16 questions [19].

The GPAQ questionnaire collects data on respondents' physical activity in three categories: physical activity at work, travel activities from place to place, and recreational or leisure activities. GPAQ data analysis is categorized based on calculating the total volume of physical activity presented in METs / minute/week. According to the analysis guide attached to the GPAQ, total physical activity levels are categorized into three groups: high, moderate, and low.

High physical activity is defined as performing heavy physical activity for at least 3 days, totaling at least 1500 MET-minutes per week, or engaging in a combination of heavy and moderate physical activities or walking for at least 7 days with a total intensity of at least 3000 MET-minutes per week. Moderate physical activity includes performing high-intensity activities for at least 20 minutes per day on 3 or more days, or engaging in moderate activities or walking for 5 or more days, totaling at least 600 MET-minutes per week. Low physical activity refers to any activity level that does not meet the criteria for the high or moderate categories, corresponding to less than 600 MET-minutes per week [20]. The validity and reliability of the GPAQ questionnaire were acceptable for assessing physical activity patterns and sedentary behavior, with Kappa (k) and Intraclass Correlation Coefficients ranging from strong to almost perfect (k: 0.864-0.976) and moderate to excellent (ICC: 0.56-0.994). Spearman's Correlation Coefficient indicated that concurrent validity was moderate to substantial (rho: 0.471-0.680), while criterion validity was sufficient to substantial (rho: 0.226-0.672) [21].

Validity and reliability tests were carried out to ensure the validity of the questionnaire's knowledge and attitude factors. Validity is a measure that indicates the degree to which an instrument is reliable and accurate. An instrument is valid if it can measure the thing being measured [5]. The questionnaire's validity and reliability were tested on 30 productive-aged individuals from the Seberang Padang Health Center and the Belimbing Health Center in Padang City. The Pearson Product-Moment correlation coefficient was used to determine validity. For the two samples ($df = n-2 = 30$), the r -table value was 0.361 (at $\alpha = 5\%$). The validity test results showed that all questionnaire items had correlation values greater than 0.361. Cronbach's alpha coefficient, a well-known internal consistency indicator, was utilized to assess questionnaire reliability. The questionnaire was reliable, with a Cronbach's alpha score of more than 0.60, indicating that

the measurement items were consistent and stable in capturing the target construct.

2.6. Data Analysis

The data processing stages must be conducted first for research analysis to produce accurate information. Data processing is performed in stages, including editing, coding, data entry, and data cleaning. Data analysis is conducted univariately, bivariately, and multivariately.

2.6.1. Univariate Analysis

Univariate analysis aims to provide a picture of each independent variable (age, gender, education, occupation, marital status, knowledge, and attitude) and the dependent variable (lack of physical activity), and is presented using frequency and percentage.

2.6.2. Bivariate Analysis

Bivariate analysis determines the link between independent and dependent variables using statistical tests, namely the Chi-square.

2.6.3. Multivariate Analysis

Multivariate Analysis uses logistic regression tests to determine the most dominant variables related to physical activity. At this stage, bivariate selection compares independent and dependent variables. If the bivariate test yields a p -value < 0.25 , the variable can be included in the multivariate analysis. The most influential variable is determined by gradually deleting p -values > 0.05 , beginning with the highest p -value and ending with a p -value ≤ 0.05 .

3. RESULTS

The results of the study were obtained based on data collection conducted on 316 productive age respondents aged 15-59 years using a questionnaire. The results of the univariate, bivariate, and multivariate analyses are presented in Tables 1 to 3.

Table 1. Univariate analysis.

No.	Variables	Category	f	%
1	Physical Activity	Low	117	37.0
		Moderate	114	36.1
		High	85	26.9
2	Age	15-39 years	155	49.1
		40-59 years	161	50.9
3	Gender	Man	97	30.7
		Women	219	69.3
4	Education	Low	69	21.8
		High	247	78.2
5	Work	Not working	144	45.6
		Work	172	54.4
6	Marital status	Single	67	21.2
		Married	249	78.8
7	Knowledge	Not good	120	38.0
		Good	196	62.0
8	Attitude	Not good	125	39.6
		Good	191	60.4

Table 2. Bivariate analysis results.

No.	Variables	Physical Activity						Total		p-value
		Low		Moderate		Heavy				
		f	%	f	%	f	%	f	%	
1	Age									
	15-39 years	68	43.9	59	38.1	28	18.1	155	100	0.001
	40-59 years	49	30.4	55	34.2	57	35.4	161	100	
2	Gender									
	Man	30	30.9	27	27.8	40	41.2	97	100	0.001
	Woman	87	39.7	87	39.7	45	20.5	219	100	
3	Education									
	Low	35	50.7	19	27.5	15	21.7	69	100	0.028
	High	82	33.2	95	38.5	70	28.3	247	100	
4	Work									
	Not working	59	41.0	60	41.7	25	17.4	144	100	0.002
	Work	58	33.7	54	31.4	60	34.9	172	100	
5	Marital status									
	Single	33	49.3	22	32.8	12	17.9	67	100	0.044
	Married	84	33.7	92	36.9	73	29.3	249	100	
6	Knowledge									
	Not good	78	65.0	25	20.8	17	14.2	120	100	0,000
	Good	39	19.9	89	45.4	68	34.7	196	100	
7	Attitude									
	Not good	83	66.4	26	20.8	16	12.8	125	100	0,000
	Good	34	17.8	88	46.1	69	36.1	191	100	

Table 3. Multivariate analysis results.

No.	Variables	Exp (B)		95% CI				p-value	
				Lower	Upper	Lower	Upper		
		Low Physical Activity	Moderate Physical Activity	Low Physical Activity	Moderate Physical Activity	Low Physical Activity	Moderate Physical Activity	Low Physical Activity	Moderate Physical Activity
1	Gender	0.02	0.185	0.006	0.008	0.07	0.47	0,000	0,000
2	Work	4.02	2.15	1.64	9.86	1.08	4.29	0.002	0.028
3	Knowledge	24.72	2.89	7.72	79.12	1.10	7.60	0,000	0.031
4	Attitude	25.83	2.78	8.81	75.75	1.12	6.90	0,000	0.028

Based on Table 1, it was found that the percentage of respondents was higher for low physical activity (37.0%), followed by moderate activity (36.1%), and high activity (26.9%). The percentage of respondents was higher among those aged 40-59 years (50.9%), females (69.3%), those with higher education (78.2%), working individuals (54.4%), and married individuals (78.8%). The percentage of respondents' knowledge level was higher at good knowledge (62.0%) and good attitude (60.4%).

Based on Table 2, the results show that the percentage of respondents who do low physical activity is higher among those aged 15-39 years (43.9%) who engage in physical activity compared to those aged 40-59 years (30.4%). The statistical test results obtained a p -value of 0.001 ($p < 0.05$), meaning that there is a relationship between age and physical activity. The gender variable for physical activity showed that women (39.7%) reported more low physical

activity than men (30.9%). The statistical test results obtained a p -value of 0.001 ($p < 0.005$), indicating a significant relationship between gender and physical activity.

The variable of education in relation to physical activity showed that the percentage of respondents who engaged in low physical activity was higher among those with lower education (50.7%) compared to those with higher education (33.2%). The statistical test results yielded a p -value of 0.028 ($p < 0.05$), indicating a significant relationship between education and physical activity. The variable related to work and physical activity showed that the percentage of respondents who engaged in physical activity was higher among those who were not working (41.0%) than among those who were working (33.7%). The statistical test results obtained a p -value of 0.002 ($p < 0.05$), meaning that there is a relationship between work and physical activity. The variable of

marital status in relation to physical activity showed that the percentage of respondents who engaged in low physical activity was higher among those who were not married (49.3%) compared to those who were married (33.7%). The statistical test results obtained a p -value of 0.044 ($p < 0.05$), meaning that there is a relationship between marital status and physical activity.

The variable of knowledge and physical activity showed that the percentage of respondents with low physical activity was higher among those with poor knowledge (65.0%) than among those with good knowledge (19.9%). The statistical test results yielded a value of $p = 0.000$ ($p < 0.05$), indicating a significant relationship between knowledge and physical activity. The percentage of respondents who did low physical activity was higher in poor attitudes (66.4%) than in good attitudes (17.8%). The statistical test results obtained a value of $p = 0.000$ ($p < 0.05$), indicating a relationship exists between attitudes and physical activity.

Multivariate analysis was obtained from the multinomial logistic regression test, which is used when the dependent variable has more than two categories. The multivariate results are presented in Table 3. The results show a relationship between gender, occupation, knowledge, and attitude towards physical activity. The male gender has a protective effect on engaging in low to moderate physical activity compared to females ($p = 0.00$; 0.000, OR = 0.02; 0.185). This means that women increase the chance of doing low and moderate physical activity. Respondents who do not work have an increased risk of doing low and moderate physical activity compared to respondents who work ($p = 0.02$; 0.028 and OR = 4.02; 2.15). Poor knowledge increases the risk of doing low and moderate physical activity compared to good knowledge ($p = 0.00$; 0.031 and OR = 24.72; 2.89). Respondents with poor attitudes increased the risk of doing low and moderate activity compared to those with good attitudes ($p = 0.00$; 0.028 and OR = 25.83; 2.78).

Physical activity is influenced by socio-demographic factors, especially gender and occupation. Suboptimal knowledge and attitudes towards the benefits of physical activity can worsen this condition. In the context of public health, low physical activity influenced by these factors increases the risk of non-communicable diseases. It reduces the quality of life for individuals while also increasing the burden of disease and health costs in society. Therefore, health promotion interventions must consider socio-demographic and educational aspects to make strategies for increasing physical activity more effective.

4. DISCUSSION

Physical activity is any body movement caused by muscle work to increase energy expenditure. This physical activity includes daily activities such as walking, running, and climbing stairs. Physical activity is not limited to sports; various everyday activities, such as cleaning the house, ironing, playing with children, and gardening can also be considered physical activities. These activities should be performed for at least 30 minutes daily or 3 to 5

days a week [6]. This study showed that more respondents engaged in light physical activity, followed by moderate and high levels of physical activity. The results of this study are in line with research in Indonesia, which has found that low physical activity is more common among productive ages [17, 22, 23].

Similar research in countries such as Nepal and the Caribbean found that people do less physical activity [24, 25]. In contrast, research in Iran found that most respondents had vigorous physical activity (36.3%), followed by low physical activity (34.5%) and moderate physical activity (29.2%) [25, 26].

This indicates that the tendency for low physical activity occurs in Indonesia and globally, especially among young and productive age groups. Factors such as increasing use of technology, limited access to sports facilities, and changes in entertainment patterns from physical activity to passive activities (such as gadget use) also contribute to this phenomenon. This difference can be caused by various contextual factors such as a healthy lifestyle culture, national health policies, or adequate physical activity support infrastructure in Iran. Thus, the similarities and differences in these results reflect the importance of considering socio-cultural factors, local policies, and respondent characteristics in understanding physical activity behavior in various regions.

In the productive age community in Padang City, it was found that the physical activity carried out tended to be light, which would increase the risk of health problems at this stage of life. This is because light activities are primarily found among respondents who do not work, such as homemakers, and those who work in offices with minimal physical activity. Sedentary behavior is often observed in productive-age employees in Padang City, as they tend to have a sedentary lifestyle [22]. Adults should start by doing physical activity in small amounts and gradually increase the frequency, intensity, and duration over time.

The bivariate analysis results showed that socio-demographics, knowledge, and attitudes were related to physical activity. This finding aligns with the results of a study by Kolahi *et al.* (2022), which demonstrated that age, gender, and occupation significantly influenced the level of physical activity ($p < 0.01$) [26]. As individuals age, they experience increasing difficulty in performing physical movements, ultimately reducing the frequency and intensity of their physical activity. This condition can increase the risk of health problems, including Noncommunicable Diseases (NCDs) such as diabetes, hypertension, and cardiovascular disease [27].

Physical activity can be performed by individuals in all age groups. However, there is a tendency for physical activity levels to decrease as age increases. This decline is closely related to physiological changes and the emergence of physical limitations, which are part of the natural aging process. However, physical activity can and should still be done by adults and elderly age groups to maintain organ function, improve metabolism, and enhance overall quality of life [3]. In this context, health workers and policymakers

must design age-appropriate interventions, for example, by promoting light to moderate physical activity such as walking, elderly gymnastics, or community-based activities tailored to the individual's physical abilities. Padang already has a car-free day program every Saturday and Sunday. The activities include gymnastics and walking together. This promotive and preventive approach must be continuously encouraged, especially in the adult and elderly population, so that people remain physically active and avoid health complications due to a sedentary lifestyle.

Gender is one of the factors that influences the level of physical activity in society. In general, men tend to be more physically active than women. The findings in this study indicate that men have higher levels of physical activity than women, which is consistent with various studies at home and abroad. In Indonesia, research by Lontoh *et al.* strengthens this finding that gender and occupation significantly affect the lack of physical activity, with women tending to have lower physical activity due to the double burden in the household [28]. This condition becomes more complex in the Minangkabau community in West Sumatra Province, where women have a central role in household management and childcare. This can limit their time and space to engage in structured physical activity. Several studies in developing countries have identified socio-cultural factors that hinder women's involvement in physical activity in most developing countries. Implications for culturally and gender-based public health interventions and work need to be carried out to increase physical activity. Education shapes an individual's knowledge, attitudes, and motivation toward physical activity.

In this study, education levels were categorized into two levels: low education (graduated from elementary school to junior high school) and high education (graduated from high school to college). This finding aligns with research in Poland, which found that respondents with low levels of education tended to be less physically active than those with secondary and higher education [10]. Several studies in Indonesia also support the positive correlation between education level and healthy lifestyle behaviors, including physical activity [16, 29].

The findings of this study provide a strong foundation for understanding that education is a strategic entry point in interventions aimed at increasing community physical activity. The data show that most respondents in Padang City have a relatively high level of education. However, high levels of education do not always correlate positively with adequate physical activity. Most respondents work in sectors with minimal physical activity, such as office work or shop/stall businesses, which require long periods of sitting or standing. Therefore, health promotion programs need to be adjusted to the level of education. Interventions should use simple language and practical approaches, such as community gymnastics or door-to-door outreach, for educated groups. Meanwhile, for highly educated groups, strategies can focus on providing evidence-based information, access to sports facilities, and digital campaigns that emphasize the benefits of physical activity for health and productivity [7].

Work is an important factor influencing a person's level of physical activity, considering that most of an individual's time is spent working. In this study, work is not only a source of income but also forms daily activity patterns, including opportunities and obstacles in physical activity. The results of this study indicate that respondents who do not work tend to have low levels of physical activity, especially in the group of housewives, who show the highest proportion in the low physical activity category. This finding is consistent with research by Sumimoto in Japan, which identified that unemployed status is strongly correlated with physical inactivity, especially in the middle and elderly age groups [30]. In Indonesia, similar results were found by the Indonesian Ministry of Health, which noted that office workers and housewives were the groups with the highest proportion of low physical activity [8]. This difference shows that physical activity has not become part of the work or household culture in Indonesia, especially in urban communities such as Padang City. Therefore, work-based interventions, such as light fitness training for housewives or gender-friendly community sports facilities, are needed.

The implications of the results of this study provide information that interventions to increase physical activity must consider the employment and social status of the local community. For unemployed groups, such as housewives, intervention programs can be developed through village-based community activities, including morning exercises together, physical activities in religious study groups, or health training at integrated health posts.

Meanwhile, for workers with sedentary activities, programs need to be encouraged, such as promoting walking during breaks, using stairs, or providing light sports facilities. This approach is educational and practical, and it can increase participation from various occupational groups. Marital status is one of the social determinants that influences health behavior, including levels of physical activity. This study found that married respondents tended to be more physically active than unmarried or living-alone respondents. This is related to social support, habits with partners, and household responsibilities, which indirectly encourage physical activity. This finding is based on the study by Yuan *et al.* (2022), which showed that married or partnered status was associated with increased physical activity, while those who lived alone were more prone to a sedentary lifestyle [11]. In Indonesia, similar results were also found by Christy (2021), who noted that married couples tend to pay more attention to their health conditions due to shared responsibilities [31].

In Minangkabau culture, married women often experience a double burden (domestic and social work), which, although it results in physical activity, is not necessarily in a form that meets health recommendations (for example, insufficient intensity and frequency). In the urban community of Padang, West Sumatra, Minangkabau customary and cultural values strongly emphasize the importance of family life and the continuation of offspring. The bond of marriage is not only a personal relationship but also part of a broader social structure. Husbands and wives often find themselves in an interconnected social environment, such as an extended family or a Nagari commu-

nity, which can foster participation in joint social and physical activities, including cooperation, group gymnastics, or community sports. Recommended intervention strategies can be to develop family-based fitness programs, such as gymnastics with partners and family morning walks. Family health messages should be included in social events, such as social gatherings, women's religious studies, or traditional meetings.

Knowledge about physical activity plays an important role in encouraging behavioral changes toward a healthy lifestyle. Individuals who possess adequate knowledge about the benefits, types, and frequency of physical activity tend to be more motivated to participate in these activities on a regular basis. This was confirmed in a study by Sheeba (2025), which showed that individuals with low levels of knowledge and negative attitudes towards physical activity were more susceptible to hypertension and physical inactivity [32]. This finding is consistent with studies by Sujarwati (2023) and Maulana (2023) in Indonesia, as well as a study by Biernat and Piatkowska (2020) in Poland, which showed that education level and knowledge were positively correlated with exercise habits [10, 16, 29]. With good knowledge, people can be more proactive in routine physical activity [33].

People with a good understanding of healthy living will engage in physical activity effectively because they recognize the positive impact of physical activity on their health. Moreover, people with the motivation and hope to achieve optimal health will continue doing physical activities according to health recommendations [4]. It is also relevant in the context of society in Padang City. Although most respondents are of productive age, low levels of knowledge were found in low physical activity, indicating that health education is not optimal. The intervention does not only focus on delivering information, but also on strengthening motivation, facilitating access, and changing the social environment.

This finding aligns with the Theory of Planned Behavior and the Health Belief Model, which explain that physical activity behavior is influenced by an individual's attitude toward the activity, subjective norms (social support), and perceptions of self-efficacy. A positive attitude toward physical activity, the belief that the environment is supportive, and perceptions of ease in doing it will increase an individual's intention and actual actions to exercise [13, 34]. Previous research supports that perceptions of health benefits and risks play a significant role in forming a positive attitude toward exercise [35]. However, a study by Yasunaga *et al.* in Japan showed that although a positive attitude has been formed, work and environmental factors can still encourage a sedentary lifestyle [36]. Therefore, it is essential to strengthen positive attitudes with adequate social and structural ecological support. These findings suggest that efforts to promote physical activity in Padang City should be implemented through a community-based approach, utilizing local values as a foundation. This approach could involve utilizing prayer rooms, mosques, and Minang social groups as media for delivering health messages that are integrated with local customs and culture.

The multivariate analysis found that the dominant variables influencing physical activity were gender, occupation, knowledge, and attitude. Knowledge and attitude were the strongest risk factors for low physical activity. This indicates that poor knowledge and attitude are the primary risk factors, even more significant than occupation or gender. This means that changes in knowledge and attitude have the potential to produce the most significant impact in efforts to increase physical activity. Based on the findings of this study, the implications are the need to prioritize educational interventions and behavioral changes as the primary strategy for reducing the proportion of low physical activity. Knowledge-building programs and the formation of positive attitudes toward physical activity have proven effective. They are expected to be able to encourage changes in community behavior toward a healthier direction. Thus, education-based interventions and behavioral modification should be the primary focus in promotive and preventive efforts related to increasing physical activity in the community.

Gender has a strong protective effect ($OR=0.02$ for low physical activity). This protective effect is very significant and consistent in both categories of physical activity (low and moderate), allowing health promotion strategies to be adjusted to the gender group most at risk (women). Occupation also increases the risk of low and moderate physical activity ($OR=4.02$ and 2.15), so workplace health promotion policies or programs can be an effective strategy. This study reveals that most respondents are women with sedentary jobs, such as teaching, trading, and childcare, which typically involve sitting and are classified as light physical activity. The matrilineal culture in Padang City, West Sumatra, places women in a central domestic role, which does not encourage involvement in heavy physical activity or formal sports. While men are more active outside the home, their activities tend to be social rather than intensely physical [37]. These findings indicate the need for increased culture-based education to increase awareness and the intention of people of a productive age to engage in physical activity in response to the increasing risk of non-communicable diseases.

In this finding, selection bias may occur because there are more female respondents than male respondents, resulting in an imbalance in the number of respondents between the two sexes, which could affect physical activity. Therefore, other random sampling techniques are necessary to achieve a more balanced gender distribution. In addition, recall bias occurs because respondents must remember the physical activities they have performed, so they are at risk of forgetting or misremembering. To minimize this bias, the study repeated several questions with different wordings to help strengthen respondents' memories and improve the accuracy of physical activity reporting.

CONCLUSION

The results showed a relationship between gender, occupation, knowledge, and attitude towards physical activity. Males have a protective chance of doing low and moderate physical activity compared to females. This means

that women are more likely to engage in low to moderate physical activity. Respondents who do not work have an increased risk of doing low and moderate physical activity compared to respondents who work. Poor knowledge increases the risk of doing low and moderate physical activity compared to good knowledge. Respondents with poor attitudes increased the risk of doing low and moderate activity compared to those with good attitudes.

This study has several limitations, including the proportion of respondents dominated by women, which can cause bias in the estimation of overall physical activity levels, considering that women have lower physical activity levels than men. To overcome this, further studies are advised to use quota or stratified sampling techniques to achieve a more balanced gender distribution. It is also recommended that the research area be expanded to include more than three health center work areas and that the number of samples be increased.

This study did not explore social, cultural, and environmental factors that have the potential to influence physical activity, such as access to recreational facilities and social norms. Therefore, qualitative research can be used in future studies to understand the barriers and supporters of physical activity contextually. The cross-sectional study design limits the ability to identify causal relationships between physical activity and related factors. Therefore, longitudinal studies are highly recommended to sustainably observe changes in physical activity behavior. Physical activity data were collected using the GPAQ questionnaire, which is susceptible to recall bias. To improve measurement accuracy, further research should combine questionnaires with other instruments. Evaluation of physical activity promotion programs is periodically conducted and adjusted to meet the changing needs of the community. This is particularly important considering that the productive age is a phase of life during which individuals can work, produce, and contribute to increasing productivity and reducing disease risk.

AUTHORS' CONTRIBUTIONS

The authors confirm contribution to the paper as follows: A., M., H., N., R. M., F., Y.M., and M.R.: Concept was developed; A. and M.: Design was carried out; M., H., and N.: Supervision was provided; F.: Data collection was done; A., M., H., and N.: Analysis and interpretation were performed; A.: Writing was done; while M., H., and N.: Critical review and editing were completed; R.M., F., Y.M., and M.R.: Validation was conducted; A., M., H., N., R. M., F., Y.M., and M.R.: Data curation was handled. All authors reviewed the results and approved the final version of the manuscript.

LIST OF ABBREVIATIONS

NCDs	=	Noncommunicable Diseases
GPAQ	=	Global Physical Activity Questionnaire
OR	=	Odds Ratio
METs	=	Metabolic Equivalents of Task

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was carried out after receiving an ethical certificate from the Research Ethics Committee of the Faculty of Medicine at Andalas University, with approval number 78/UN.16.2/KEP-FK/2023, dated February 16, 2023, and a research permit from the Doctoral Study Program in Public Health, with number 23/UN16/S3-KES/TU/2023. Furthermore, a research permit was received from the Integrated Licensing Agency and One-Stop Integrated Service of Padang City, with permit number 070.4751/DPMTSP-PP/I/2023 dated February 15, 2023.

HUMAN AND ANIMAL RIGHTS

The ethical standards of the institutional and research committee, as well as the principles of the 1975 Helsinki Declaration, as revised in 2013, were adhered to in the execution of all research techniques on human volunteers.

CONSENT FOR PUBLICATION

Written informed consent was obtained.

STANDARDS OF REPORTING

The STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

We have uploaded the data on zenodo with the following link: <https://zenodo.org/records/17314531>.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

We want to thank all subjects who participated in this study.

REFERENCES

- [1] Maksum A, Indahwati N. Patterns of physical activity and its impact on health risk and life satisfaction: Evidence from adults in Indonesia. *Int J Hum Mov Sports Sci* 2019; 9(6): 1087-96. <http://dx.doi.org/10.13189/saj.2021.090602>
- [2] Noncommunicable diseases. 2025. Available from: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- [3] Sasti C. Physical activity in health. Eureka Media Aksara. Purbalingga: Eureka Media Aksara 2024.
- [4] Wicaksono A, Handoko W. Physical activity and health. IAIN Pontianak Press. Pontianak: IAIN Pontianak Press 2020.
- [5] Iftitahurroza HT. Physical activity management in primary healthcare. 2024. Available from: https://www.google.co.id/books/edition/Manajemen_Aktivitas_Fisik_di_Layanan_Kes/UwI6EQAAQBAJ?hl=id&gbpv=1&dq=Manajemen%20Aktivitas%20Fisik%20di%20Pelayanan%20Kesehatan%20Primer&pg=PA4&printsec=frontcover
- [6] Global status report on physical activity 2022 2022. Available from: <https://www.who.int/teams/health-promotion/physical-activity/global-status-report-on-physical-activity-2022>

- [7] National report on the sport development index 2021: Sport for human development investment. 2021. Available from: <https://deputi2.kemendikpora.go.id/dokumen/30/laporan-nasional-sport-development-index-tahun-2021>
- [8] National Report on the Basic Health Research (Riskesdas) 2018. 2019. Available from: <https://layanandata.kemkes.go.id/katalog-data/riskesdas/ketersediaan-data/riskesdas-2018>
- [9] Mengesha MM, Roba HS, Ayele BH, Beyene AS. Level of physical activity among urban adults and the socio-demographic correlates: A population-based cross-sectional study using the global physical activity questionnaire. BMC Public Health 2019; 19(1): 1160. <http://dx.doi.org/10.1186/s12889-019-7465-y> PMID: 31438909
- [10] Biernat E, Piatkowska M. Sociodemographic determinants of physical inactivity of people aged 60 years and older: A cross-sectional study in Poland. Biomed Res Int 2020; 2020: -. <http://dx.doi.org/10.1155/2020/7469021>
- [11] Yuan S, Elam KK, Johnston JD, Chow A. The influence of marriage and cohabitation on physical activity among middle-aged and older people. J Appl Gerontol 2024; 43(2): 139-48. <http://dx.doi.org/10.1177/07334648231203124> PMID: 37919978
- [12] Asrizal CW, Farrastama MD. The relationship between knowledge level and physical activity level as a way to prevent metabolic syndrome. Syiah Kuala Med J 2021; 21(2) <http://dx.doi.org/10.24815/jks.v21i2.20566>
- [13] Yudhia Fratidhina B. Implementation of Behavior Change Strategies. Barnel Nobel 2025.
- [14] Asriati HTJ, Adimuntja N, Pamangin LOM. Analisis aktivitas fisik remaja Papua untuk pencegahan hipertensi analysis of the physical activity of Papuan adolescents for hypertension prevention. Promot Prevent J 2023; 6(2): 245-55. <http://dx.doi.org/10.47650/jpp.v6i2.738>
- [15] Suarjana IWGS, Sudirham S, Manopo JE, Pongoh LL, Supit ASA. Differences in physical activity based on individual characteristics in south minahasa society. Altius: J Ilmu Olahraga dan Kesehatan 2023; 12(2): 414-26. <http://dx.doi.org/10.36706/altius.v12i2.23>
- [16] Sujarwati A, Agustina E, Azmiyannoor M, Rosadi D. Factors associated with physical activity behavior in adolescents in Banjarbaru city in 2021. J Biostat Popul Health Inform 2023; 3(3): 192-200. <http://dx.doi.org/10.7454/bikfokes.v3i3.1048>
- [17] Abadini D, Wuryaningsih C E. Determinants of physical activity of adult office workers in Jakarta in 2018. Indones Health Promot J 2019; 14(1): 15-28. <http://dx.doi.org/10.14710/jpki.14.1.15-28>
- [18] Regulation of the minister of health of the republic of Indonesia, technical standards for fulfilling minimum health service standards. 2024. Available from: <https://peraturan.bpk.go.id/Details/288060/permenkes-no-6-tahun-2024>
- [19] Global Physical Activity Questionnaire (GPAQ) 2021. Available from: <https://www.who.int/citations/m/item/global-physical-activity-questionnaire>
- [20] Global Physical Activity Questionnaire (GPAQ) analysis guide. 2021. Available from: <https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/physical-activity-surveillance>
- [21] Ribeiro M, Fernandes E, Borges M, et al. Reliability and validity of the global physical activity questionnaire for portuguese adults. Percept Mot Skills 2024; 131(5): 1548-70. <http://dx.doi.org/10.1177/00315125241266341> PMID: 39045817
- [22] Englardi NP, Cleodora C. Overview of sedentary lifestyle, physical activity, and body complaints of productive-age employees at Padang City Hall office 2021. Kusuma Husada Health J 2021; 13(1): 77-83.
- [23] Tukuboya VT, Malonda NSH, Sanggelorang Y. Overview of physical activity among educators and administrative staff of the Faculty of Public Health, Sam Ratulangi University during the COVID-19 pandemic. J KESMAS 2020; 9(6): 35-45.
- [24] Bista B, Dhimal M, Bhattarai S, et al. Prevalence of non-communicable diseases risk factors and their determinants: Results from STEPS survey 2019, Nepal. PLoS One 2021; 16(7): e0253605. <http://dx.doi.org/10.1371/journal.pone.0253605> PMID: 34329300
- [25] Pengpid S, Peltzer K. Multiple behavioural risk factors of non-communicable diseases among adolescents in four Caribbean countries: Prevalence and correlates. Int J Adolesc Med Health 2021; 1-8.
- [26] Kolahi A, Moghisi A, Kousha A, Soleiman-ekhtiari Y. Physical activity levels and related sociodemographic factors among Iranian adults: results from a population-based national STEPS survey. Med J Islam Repub Iran 2022; 34: 39. <http://dx.doi.org/10.47176/mjiri.34.172>
- [27] Kusumo MP. Physical Activity Monitoring Book. Yogyakarta: The Journal Publishing 2021; 1.
- [28] Lontoh SO, Kumala M. Overview of physical activity levels in the Tomang Village Community, West Jakarta. J Muara Sains Med Technol Health Sci 2020; 4(1): 453-62.
- [29] Maulana MN. Knowledge about the healthy living community movement (Germa) In Bontosunggu Village, sub-district South Bontonompo, Gowa Regency. Window Public Health 2023; 3: 3-9.
- [30] Sumimoto Y, Yanagita M, Miyamatsu N, et al. Association between socioeconomic status and physical inactivity in a general Japanese population: NIPPON DATA2010. PLoS One 2021; 16(7): e0254706. <http://dx.doi.org/10.1371/journal.pone.0254706> PMID: 34265008
- [31] Christy J, Junita Bancin L. The relationship between characteristics (Age, Gender, Marital Status) and physical activity and social activity of the elderly in the Padangmatinggi Community Health Center Work Area, Padangsidempuan City. 2019. Available from: <http://sintaks.kitamenulis.id/index.php/Sintaks>
- [32] Sheeba ME, Sridevi S, Senthilkumar T, Venkatesh N. Knowledge, attitude and practice of structured physical activity in patients with hypertension. J Neonatal Surg 2025; 14(3): 1-10. <http://dx.doi.org/10.52783/jns.v14.2150>
- [33] Sulaiman ES. Education and health promotion. Gajah Mada University Press 2022.
- [34] Irwan, Ethics and Health Behavior. Absolut Media, 2018. 2018. Available from: <https://repository.ung.ac.id/karyailmiah/show/1784/irwan-buku-etika-dan-perilaku-kesehatan.html>
- [35] Cavallini MF. Elderly individuals have similar attitudes towards physical activity and exercise as the young and middle aged, but are less likely to seek companionship or gym memberships. J Family Med Dis 2022; 8(1): 148. <http://dx.doi.org/10.23937/2469-5793/1510148>
- [36] Yasunaga A, Shibata A, Ishii K, et al. Replacing sedentary time with physical activity: effects on health-related quality of life in older Japanese adults. Health Qual Life Outcomes 2018; 16(1): 240. <http://dx.doi.org/10.1186/s12955-018-1067-8> PMID: 30587199
- [37] Husna L. The Relationship between matrilineal culture and gender roles in Minang Migrant Households (Case: Minang family ties in East Jakarta City). JSKPM 2025; 8(3): 40-54. <http://dx.doi.org/10.29244/jskpm.v8i03.1328>