



Original article

## Factors Associated with Physical Activity among Study Participants at Buho-Buho Primary Health Center, Pulau Morotai Regency

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### Abstract

**Introduction:** Physical activity plays an important role in maintaining health and preventing non-communicable diseases. However, levels of physical activity are influenced by various demographic and lifestyle factors, particularly in primary healthcare settings.

**Objective:** This study aimed to analyze factors associated with physical activity among study participants at Buho-Buho Primary Health Center, Pulau Morotai Regency

**Method:** This study employed analytical observational design with a cross-sectional approach. A total of 69 participants were included using a total sampling technique. Physical activity was categorized as active and physically inactive. Independent variables included demographic characteristics (gender, age group, marital status, educational level, and employment status) and lifestyle factors (smoking habits). Data were analyzed using SPSS version 26. Descriptive analysis was presented as frequencies and percentages, while bivariate analysis was conducted using the Chi-square test or Fisher's exact test, with a significance level of  $p < 0.05$ .

**Results:** The results showed that gender ( $p = 0.013$ ), age group ( $p < 0.001$ ), employment status ( $p = 0.020$ ), and smoking habits ( $p = 0.006$ ) were significantly associated with physical activity. Marital status and educational level were not significantly associated with physical activity.

**Conclusion:** Physical activity was significantly associated with gender, age group, employment status, and smoking habits among study participants. These findings highlight the importance of considering demographic and lifestyle factors in promoting physical activity at the primary healthcare level.

**Keywords:** Demographic factors, Physical activity, Primary health center, Smoking habits

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### INTRODUCTION

Physical activity is widely recognized as a fundamental determinant of health and well-being across the course of life. Regular engagement in physical activity contributes to the prevention and management of major non-communicable diseases (NCDs), including cardiovascular disease, type 2 diabetes mellitus, obesity, and certain cancers, while also improving mental health, functional ability, and quality of life (Bull *et al.*, 2020; Guthold *et al.*, 2018). The World Health Organization (WHO) recommends that adults engage in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week to achieve substantial health benefits (WHO, 2020). Despite these well-established benefits, physical inactivity remains a major global public health concern and is identified as one of the leading risk factors for premature mortality worldwide (Katzmarzyk *et al.*, 2022).

Globally, insufficient physical activity accounts for a considerable proportion of the burden of NCDs and contributes significantly to health system strain, particularly in low- and middle-income countries (Guthold *et al.*, 2018). Rapid urbanization, technological advancement, and changes in occupational and transportation patterns have contributed to increasingly sedentary lifestyles across populations (Katzmarzyk *et al.*, 2022). As a result, promoting physical activity has become a key public health priority and an essential component of strategies aimed at reducing the growing burden of NCDs (Bull *et al.*, 2020).

Physical activity behavior is complex and influenced by a wide range of factors operating at individual, social, environmental, and policy levels. Socio-demographic characteristics such as gender, age,

educational level, employment status, and marital status have consistently been shown to influence physical activity participation (Choi *et al.*, 2017). Lifestyle behaviors, including smoking and other health-related habits, are also closely linked to physical activity patterns and may cluster together in specific population groups (Pedersen *et al.*, 2021).

Evidence from previous studies suggests that physical activity levels often decline with increasing age, while employment status and occupational demands play a significant role in shaping daily activity, particularly in low-income and rural settings (Choi *et al.*, 2017). Gender differences in physical activity are also context-dependent; in many low- and middle-income countries, women may accumulate substantial physical activity through domestic and occupational roles rather than structured leisure-time exercise (Moniruzzaman *et al.*, 2017). Understanding these socio-demographic and lifestyle determinants is essential for designing effective, targeted physical activity promotion strategies that reflect local contexts.

Primary health care (PHC) plays a crucial role in health promotion and disease prevention, serving as the first point of contact for most individuals within the health system. PHC settings provide a strategic platform for identifying physical inactivity, delivering counseling, and implementing community-based interventions to promote active lifestyles (WHO & UNICEF, 2018). However, most evidence on physical activity determinants is derived from urban populations or large-scale national surveys, with limited focus on primary health care populations in rural and geographically remote areas (Choi *et al.*, 2017).

In rural and island regions, physical activity patterns may differ substantially from those in urban settings. Occupational and household activities often constitute the primary sources of physical activity, while leisure-time physical activity is relatively uncommon (Moniruzzaman *et al.*, 2017). Socioeconomic constraints, limited infrastructure, and cultural norms may further influence physical activity behaviors in these settings (Pedersen *et al.*, 2021). Despite these contextual differences, empirical data on physical activity and its associated factors in rural primary health care settings remain scarce, particularly in eastern Indonesia and other remote regions. Given the rising burden of non-communicable diseases and the critical role of physical activity in their prevention, there is a clear need for context-specific evidence to inform health promotion efforts at the primary health care level (Bull *et al.*, 2020).

Limited data are available on the socio-demographic and lifestyle factors associated with physical activity among primary health care attendees in rural and island settings in Indonesia. Understanding these factors is essential for developing effective, locally relevant interventions that can be integrated into routine primary care services. Therefore, this study aimed to analyze the factors associated with physical activity among adults attending Buho-Buho Primary Health Center in Pulau Morotai Regency. Specifically, the study examined the relationship between physical activity and selected demographic characteristics (gender, age group, marital status, educational level, and employment status) as well as lifestyle factors (smoking habits). The findings are expected to contribute to the evidence base for physical activity promotion in primary health care settings and support the development of targeted strategies to improve population health in rural and remote areas.

## **METHOD**

This study employed an analytical observational design with a cross-sectional approach and was conducted at Buho-Buho Primary Health Center, Pulau Morotai Regency, Indonesia, in 2024. The study population comprised all individuals who visited the health center during the study period. A total of 69 participants who met the inclusion criteria were recruited using a total sampling technique, whereby all eligible individuals were included in the study. Participants were included if they were aged 18 years or older, able to communicate effectively, and willing to participate. Individuals with incomplete data or those who declined to provide informed consent were excluded.

Physical activity was defined as the dependent variable and categorized into two groups, active and physically inactive, based on self-reported physical activity levels. Independent variables included demographic characteristics (gender, age group, marital status, educational level, and employment status) and lifestyle factors, specifically smoking habits. Data was collected using a structured questionnaire administered through face-to-face interviews by trained enumerators under the supervision of the research team. The questionnaire covered socio-demographic characteristics, smoking habits, and physical activity. All data were coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics were used to summarize participant characteristics and are presented as frequencies and percentages. Bivariate analysis was performed to assess the association between physical activity and independent variables using the Chi-square test. Fisher's exact test was applied when expected cell counts were less than five. A *p*-value of < 0.05 was considered statistically significant. Ethical approval for this study was obtained from the relevant ethics committee (approval number: 445/314/PKM-

BU/XII/2025). Written informed consent was obtained from all participants prior to data collection, and participant confidentiality and anonymity were strictly maintained throughout the study.

## RESULTS

Table 1 summarizes the characteristics of the study participants at Buho-Buho Primary Health Center in Pulau Morotai Regency in 2024. Of the 69 respondents, the majority were female (63.8%) and older adults (58.0%). Most participants were married (92.8%) and had a primary school education (92.8%). Additionally, 73.9% of respondents were employed. Regarding lifestyle factors, 40.6% of participants reported smoking, while 66.7% were classified as physically active.

**Table 1.** Characteristic of Study Participants at Buho-Buho Primary Health Center, Pulau Morotai Regency, 2024

Variable	Frequency (n= 69)	Percent (%)
<b>Demographic Characteristics</b>		
<b>Gender</b>		
Male	25	36.2
Female	44	63.8
<b>Age Group</b>		
Adults	29	42.0
Older Adults	40	58.0
<b>Marital Status</b>		
Married	64	92.8
Unmarried (single/divorced)	5	7.2
<b>Educational Level</b>		
Primary School	64	92.8
Junior High School	5	7.2
<b>Employment Status</b>		
Employed	51	73.9
Unemployed	18	26.1
<b>Lifestyle Factors</b>		
<b>Smoking habits</b>		
Yes	28	40.6
No	41	59.4
<b>Physical Activity</b>		
Active	46	66.7
Physically inactive	23	33.3

Table 2 shows the results of the bivariate analysis examining factors associated with physical activity among study participants. Gender was significantly associated with physical activity ( $p = 0.013$ ), with a higher proportion of females classified as physically active compared to males. Age group also showed a significant association with physical activity ( $p < 0.001$ ), where adults were more likely to be physically active than older adults.

Employment status was significantly related to physical activity ( $p = 0.020$ ), as employed participants demonstrated higher levels of physical activity compared to unemployed participants. In addition, smoking habits were significantly associated with physical activity ( $p = 0.006$ ), with non-smokers showing a higher proportion of physical inactivity compared to smokers. Conversely, marital status ( $p = 0.189$ ) and educational level ( $p = 0.101$ ) were not significantly associated with physical activity.

**Table 2.** Bivariate Analysis of Factors Associated with Physical Activity at Buho-Buho Primary Health Center, Pulau Morotai Regency, 2024

Variable	Physical Activity				p-Value
	Active		Physically Inactive		
	n	(%)	n	(%)	
<b>Demographic Characteristics</b>					
<b>Gender</b>					
Male	12	(17.4)	13	(18.8)	0.013*
Female	34	(49.3)	10	(14.5)	
<b>Age Group</b>					
Adults	29	(42.0)	0	(0.0)	0.000*
Older Adults	17	(24.6)	23	(33.3)	

<b>Marital Status</b>					0.189
Married	44	(63.8)	20	(29.0)	
Unmarried	2	(2.9)	3	(4.3)	
<b>Educational Level</b>					0.101
Primary School	41	(59.4)	23	(3.3)	
Junior High School	5	(7.2)	0	(0.0)	
<b>Employment status</b>					0.020*
Employed	38	(55.1)	13	(18.8)	
Unemployed	8	(11.6)	10	(14.5)	
<b>Lifestyle Factors</b>					
<b>Smoking Habits</b>					0.006*
Yes	24	(34.8)	4	(5.8)	
No	22	(31.9)	19	(2.5)	

\* $p < 0.05$

## DISCUSSION

This study examined socio-demographic and lifestyle factors associated with physical activity among adults attending Buho-Buho Primary Health Center in Pulau Morotai Regency. The findings showed that gender, age group, employment status, and smoking habits were significantly associated with physical activity, whereas marital status and educational level were not. These results highlight the importance of contextual and behavioral determinants of physical activity in rural and island primary healthcare settings, where daily activity is largely derived from occupational and domestic tasks rather than leisure-time exercise (Allen *et al.*, 2017; Guthold *et al.*, 2018; Mello *et al.*, 2021). Gender was significantly associated with physical activity, with females being more physically active than males. This finding aligns with evidence from Southeast Asia indicating that women in rural contexts accumulate substantial physical activity through household and informal economic activities, contrasting with patterns observed in urban and high-income settings (Thanamee *et al.*, 2017; Tran *et al.*, 2020; Zeng *et al.*, 2019).

These results emphasize the importance of considering activity domains when interpreting gender differences. Age group was strongly associated with physical activity, with adults more active than older adults. This is consistent with regional studies reporting age-related declines in physical activity due to reduced functional capacity and increased chronic disease burden (Pengpid & Peltzer, 2022). Primary healthcare services should therefore prioritize age-appropriate physical activity promotion for older populations. Employment status was also significantly associated with physical activity, reflecting the contribution of manual labor and active transportation to total activity in rural settings. Studies from Southeast Asia have shown that occupational activity constitutes a major component of physical activity, while leisure-time activity remains limited (Guthold *et al.*, 2018; Thanamee *et al.*, 2017).

Smoking habits were positively associated with physical activity, a pattern observed in Southeast Asian populations where smoking is common among individuals in physically demanding occupations. This suggests behavioral clustering and underscores the need for integrated health promotion addressing multiple lifestyle behaviors simultaneously (Pengpid *et al.*, 2018; Pengpid & Peltzer, 2022). Marital status and educational level were not associated with physical activity, likely due to homogeneous educational attainment and the predominance of non-leisure physical activity in rural populations (Allen *et al.*, 2017; Tan *et al.*, 2021). Overall, these findings support a context-sensitive, socio-ecological approach to physical activity promotion in rural primary healthcare settings.

## CONCLUSION

This study found that physical activity among adults attending a primary health care center in Pulau Morotai Regency was significantly associated with gender, age group, employment status, and smoking habits, while marital status and educational level were not. Higher activity levels among women and employed individuals indicate that occupational and domestic activities are major contributors to physical activity in rural settings. Lower activity among older adults highlights the need for age-appropriate physical activity promotion within primary care. The coexistence of smoking and high physical activity underscores the complexity of lifestyle behaviors and the importance of integrated health promotion strategies. Context-sensitive primary health care interventions are essential to support physical activity and NCD prevention in rural communities.

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