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Prevalence of physical inactivity and associated factors among adults in Harar town, Eastern Ethiopia

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Data Interpretation
E Manuscript Preparation
F Literature Search
G Funds Collection

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abstract

Background: The burden of physical inactivity was hidden in many low- and middle-income countries. This study determined the prevalence of physical inactivity and associated factors among adults in Harar town, Eastern Ethiopia.

Material/Methods: A community-based cross-sectional study was conducted among 601 adults in April 2016. Global Physical Activity Questionnaire (GPAQ) ver. 2 was used to collect the data through face-to-face interview. Data were entered into EpiData version 3.02. Then, exported and analyzed using Statistical Package for Social Science (SPSS) version 20. A binary logistic regression model was performed to identify factors associated with physical inactivity.

Results: The prevalence of physical inactivity was 45.5% (95% CI: 41.1%, 49.6%). Being female (AOR = 2.36; 95% CI: 1.57, 3.53), age group from 41–50 years (AOR = 3.02; 95% CI: 1.68, 5.45), privately employed (AOR = 0.57; 95% CI: 0.36, 0.91), monthly incomes from 3,001–5,000 Ethiopian birr (AOR = 3.71; 95% CI: 2.09, 6.56) and having no information about physical activity guidelines (AOR = 3.48; 95% CI: 2.00, 6.03) were significantly associated with physical inactivity.

Conclusions: The majority of adults are at greater risk of developing non-communicable diseases due to high prevalence of inactivity. Thus, immediate actions are suggested with community-based physical activity interventions.

Key words: physical inactivity, non-communicable diseases, prevalence, factors, Ethiopia.

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INTRODUCTION

Physical activity is any movement done through our body that can expend energy. Generally, physical inactivity implies not achieving the minimum requirements of physical activity for health. In the case of this study, it is not practicing 150 minutes of moderate to 75 minutes of vigorous intensity aerobic activity per week. In other words, adults who practiced physical activity for less than 600 metabolic equivalents (METs)-minutes per week were considered physically inactive. An adult who does not fulfill this requirement is at a greater risk of developing non-communicable diseases (NCDs) [1].

Physical inactivity is one of the current major global health problems that need immediate action. It was ranked as the fourth major cause of death in the world. However, the burden of physical inactivity was hidden in many low- and middle-income countries including Ethiopia [2]. Evidence showed that physical inactivity contributed to 9% of all deaths in the globe. Likewise, inactivity shared 5.2% of all deaths recorded in Ethiopia. On the other hand, physical inactivity can raise the magnitude of NCDs. Studies indicated that 6% of coronary heart diseases, 7% of type 2 diabetes mellitus, 10% of breast and colon cancers were due to inactivity [3]. Similarly, a study from South Africa showed that 30% of ischemic heart disease, 22% of ischemic stroke, 20% of type 2 diabetes mellitus, 17% of breast cancer and 27% of colon cancer were due to physical inactivity [4].

Physical inactivity has become prevalent in many countries. Studies reported that the prevalence of physical inactivity were 79.0% in Saudi Arabia, 56.2% in China, 43.7% in Malaysia and 43.3% in Nepal [5–8]. It is also prevalent in many African countries. For instance, it was 60.5% in South Africa, 53.2% in Mali, 31.4% in Nigeria, 14.1% in Kenya and 18.9% in Ethiopia [9–12]. This implies that the burden of inactivity is on the rise in many countries and is becoming pandemic [2].

Moreover, studies identified that different factors had a significant association with physical inactivity. Factors such as sex, age, educational status, occupation, monthly incomes, overweight or obesity, history of NCDs and information about physical activity guidelines were associated with physical inactivity [6, 12, 13–18].

Research on physical inactivity among adults in Ethiopia, including the Harar town, is very limited. Therefore, this study determined the prevalence of physical inactivity and associated factors among adults in Harar, Eastern Ethiopia. As a result, this study has a significant contribution to policy makers, scientific community and organizations working on NCDs which serve as a source of information.

MATERIAL AND METHODS

A community-based cross-sectional study was conducted among 601 adults in Harar, Eastern Ethiopia in April 2016. All adults aged 18–64 living in the town from randomly selected Kebeles were included in the study. However, adults who were too sick and unable to communicate during the study period were excluded from the study.

The sample size was calculated using double population proportion formula through StatCalc program of Epi Info version 7. Information from a study conducted in Nigeria was used to run this software program [11]. Necessary steps were followed. Assumptions of 95% confidence interval and 80% power were considered. Finally, the required sample size amounted to 601, including 10% non-response rate.

A multistage sampling technique was used to select the study participants. Six Kebeles were selected out of 19 using a lottery method. Then, 301 households were selected by systematic random sampling. These households were stratified into 12 strata based on their house number. The household was selected from a stratum using a systematic random sampling technique. The total sample size was randomly allocated proportionally based on the size of adult populations. An eligible adult (aged 18–64 years) was selected from households using lottery method. A maximum of two eligible adults in the selected household were enrolled in the study. In case there were more than two adults in a single household, a lottery method would be used to select the required study participants.

Global Physical Activity Questionnaire (GPAQ) version 2 was used to collect the data through face-to-face interviews. During an interview, a GPAQ generic show card was displayed for the study participants to clarify types of physical activity [19]. Six nurses and two health officers were recruited as data collectors and supervisors, respectively. Two days training was given to both data collectors and supervisors on the data collection instrument and methods.

Anthropometric measurements (weight and height) were measured twice, and an average was taken as the final result. Weight was measured to the nearest of 0.01 kg in light clothing using portable digital scales. Likewise, height was measured to the nearest of 0.1 cm using a non-flexible tape measure while respondents were standing in upright positions. Then, the body mass index (BMI) was calculated by dividing the participants' weight in kilograms by squared height in meters.

To control the quality of data, a questionnaire was translated into the local language to suit local conditions and back translated into English to keep consistency by experts. Data collectors and supervisors were trained, questionnaires and anthropometry measurements were pre-tested on 5% of the total sample size out of the study area; close supervision was made by supervisors throughout the data collection period, and double data entry was made.

Physical inactivity was measured using Metabolic Equivalents (METs)-minutes per week. It was calculated by adding the products of corresponding METs values and the number of days and time spent in a typical week for each domain [19]. Finally, the number of adults who practiced less than 600 METs-minutes per week was divided by the total number of study subjects then multiplied by 100% to determine the prevalence of physical inactivity. Data were entered into EpiData version 3.02, then exported and analyzed using Statistical Package for Social Science (SPSS) version 20. Descriptive statistics were done for the frequency of distribution, mean, standard deviation and crosstabs. A binary logistic regression model was performed to identify factors associated with physical inactivity. In bivariate analysis, variables with p-value less than 0.3 were entered into multivariate analysis to control a confounding effect. Variables at p-value less than 0.05 with adjusted odds ratio at 95% confidence interval had statistical significance in multivariate analysis.

Ethical approval was obtained from Institutional Health Research and Ethics Review Committee (IHRERC) of Haramaya University, College of Health and Medical Science. A written consent was obtained from study subjects prior to data collection. The study participants' full right to privacy and confidentiality of was kept.

RESULTS

Out of the total sample size, only 567 adults participated in this study which brought 94.3% response rate. The mean age was 33.5 years with the standard deviation of ±12.3. The majority of the study participants were females (58.4%), categorized in age groups of 18–30 years old (41.6%), married (64.0%), with high school completed (33.0%), privately employed (49.9%), with monthly incomes of less than 1,000 Ethiopian Birr (ETB) (54.7%), having no information about physical activity guideline (83.1%), not having NCDs history (86.1%) and have a normal body mass index (76.0%) than others, as shown in Table 1.

Table 1. Characteristics of the study participants among adults in Harar town, Eastern Ethiopia, April 2016 (n = 567)

Variables	Characteristics	Frequency (%)
Sex	Male	236 (41.6%)
	Female	331 (58.4%)
Age group (in years)	18-30	310 (54.7%)
	31-40	109 (19.2%)
	41-50	78 (13.8%)
	51-64	70 (12.3%)
Maritial status	Single	184 (32.2%)
	Married	366 (64.0%)
	Divorced	7 (1.2%)
	Separated	13 (2.3%)
	Widowed	2 (0.3%)
Educational level	Illiterate	62 (10.9%)
	Elementary school (1–8)	132 (23.3%)
	High school (9–12)	187 (33.0%)
	College diploma and above	186 (32.8%)
Occupation	Unemployed	192 (33.9)
	Government employed	81 (14.3%)
	Privately employed	283 (49.9%)
	NGO employed	11 (1.9%)
Monthly income (ETB)	<1000	231 (40.7%)
	1001–3000	166 (29.3%)
	3001–5000	107 (18.9%)
	>5001	63 (11.1%)
Having information about physical activity guidelines	Yes	96 (16.9%)
	No	471 (83.1%)
Having history of NCDs	yes	79 (13.9%)
	No	488 (86.1%)
Body Mass Index	Normal	431 (76.0%)
	Underweight	7 (1.2%)
	Overweight	92 (16.2%)
	Obese	37 (6.5%)

NCDs = non-communicable diseases, ETB = Ethiopian Birr, NGO= non-governmental organization

The prevalence of physical inactivity was 45.5% (95% CI: 41.1%, 49.6%). It was higher among females (55.3%), age group 41–50 years old (69.2%), illiterate (58.1%), unemployed (56.2%), with monthly incomes of 3001–5000 ETB (64.5%), having no information about physical activity guideline (50.1%) and having history of NCDs (62.0%) than others, as shown in Table 2.

Table 2. Factors associated with physical inactivity among adults in Harar town, Eastern Ethiopia, April 2016 (n = 567)

Characteristics	Physical activity status		Adjusted	P-value
	Inactive n (%)	Active n (%)	OR (95%CI)	
Sex				
Male	75 (31.8%)	161 (68.1%)	1	
Female	183 (55.3%)	148 (44.7%)	2.36 (1.57, 3.53)	**0.000***
Age group (in years				
18-30	127 (41.0%)	183 (59.0%)	1	
31-40	41 (37.6%)	68 (62.4%)	0.78 (0.48, 1.29)	0.343
41-50	54 (69.2%)	24 (30.8%)	**3.02 (1.68, 5.45)**	**0.000***
51-64	36 (51.4%)	34 (48.6%)	1.06 (0.54, 2.05)	0.875
Educational level				
Illiterate	127 (41.0%)	183 (59.0%)	1	
Elementary school (1–8)	41 (37.6%)	68 (62.4%)	0.78 (0.48, 1.29)	0.343
High school (9–12)	54 (69.2%)	24 (30.8%)	**3.02 (1.68, 5.45)**	**0.000***
College diploma and above	36 (51.4%)	34 (48.6%)	1.06 (0.54, 2.05)	0.875
Occupation				
Unemployed	108 (56.2%)	26 (41.9%)	1.53 (0.77, 3.05)	0.226
Government employed	36 (44.4%)	69 (52.3%)	1.11 (0.64, 1.92)	0.706
Privately employed	110 (38.9%)	113 (60.4%)	0.89 (0.54, 1.46)	0.638
NGO employed	4 (36.4%)	101 (54.3%)	1	
Monthly income (ETB)				
<1000	96 (41.6%)	135 (58.4%)	1	
1001–3000	66 (39.8%)	100 (60.2%)	1.47 (0.89, 2.41)	0.131
3001–5000	69 (64.5%)	38 (35.5%)	**3.71 (2.09, 6.56)**	**0.000***
>5001	27 (42.9%)	36 (57.1%)	1.57 (0.80, 3.09)	0.190
Having information about physical activity guidelines				
Yes	22 (22.9%)	74 (77.1%)	1	
No	236 (50.1%)	235 (49.9%)	**3.48 (2.00, 6.03)**	**0.000***
Having history of NCDs				
Yes	49 (62.0%)	30 (38.0%)	1.75 (0.94, 3.26)	0.079
No	209 (42.8%)	279 (57.2%)	1	

**P-value < 0.05 statistically significant at 95%CI. NCDs = non-communicable diseases*

Variables such as sex, age, educational level, occupation, monthly income, information about physical activity guideline and history of NCDs were taken from bivariate into multivariate analysis to control a confounding effect. In the multivariate model, female participants were more than twice more likely to be physically inactive than males (AOR= 2.36; 95% CI: 1.57, 3.53). Adults aged from 41–50 years were 3 times more likely to be inactive than those aged 18–30 years (AOR= 3.02; 95% CI: 1.68, 5.45). Participants with a monthly income from 3001–5000 ETB were more than 3 times more likely to be inactive than those who earned less than 1000 ETB (AOR= 3.71; 95% CI: 2.09, 6.56). Likewise, adults those had no information about physical activity guideline were over than 3 times more likely to be inactive than those informed (AOR= 3.48; 95% CI: 2.00, 6.03). However, privately employed adults were 43% times less

over than 3 times more likely to be inactive than those informed (AOR= 3.48; 95% CI: 2.00, 6.03). However, privately employed adults were 43% times less likely to be inactive than those unemployed (AOR= 0.57; 95% CI: 0.36, 0.91), as shown in Table 2.

DISCUSSION

This study revealed high prevalence of physical inactivity among adults in the Harar town. Almost half of the study participants were physically inactive. The majority of adults were at a greater risk of developing non-communicable diseases as a result of inactivity. This finding was consistent with the study result of 43.7% and 43.3% reported from Malaysia and Nepal, respectively [7, 8]. This similarity might be due to the pandemic occurrence of physical inactivity [2, 18]. On the other hand, it was higher than in studies conducted in Mexico (19.4%), Poland (32%), Kenya (14.4%) and Nigeria (31.4%, 19.2%) [11, 12, 16, 18, 21]. By contrast, this finding was lower than evidence reported in China (56.2%), Saudi Arabia (79.0%, 66.6%), South Africa (60.5%) and India (54.4%) [5, 6, 9, 22, 23]. These variations might be due to the study period, setting and lifestyle differences.

This study identified the magnitude of inactivity among the three domains of physical activity. There was high magnitude of physical inactivity in the workplace domain. This implies that more adults were inactive during their regular working hours, which has a negative effect on their health and productivity. This finding was comparable with studies done in Brazil (68.9%, 82.9%) and Saudi Arabia (79.8%) [13, 17, 22]. This similarity might be due to long sitting habit at workplace in many countries. Similarly, the magnitude of inactivity in the transportation domain was high. This finding was consistent with a study done in Saudi Arabia (53.9%) [22]. But, it was higher than in the study finding of 32.0% from Brazil [17]. Conversely, it was lower than another study result of 91.7% from Brazil [13]. The reason might be due to initiation of physical activity interventions and the study period difference. During recreational time, the highest magnitude of inactivity was found in all domains. This finding was consistent with studies from Nigeria (96.0%) and Saudi Arabia (87.9%) [22, 24]. However, this result was higher than in the studies conducted in Brazil (10.1%, 77.5%) [13, 17]. The possible reason might be due to variations in availabilities and accessibilities of recreational places that can encourage physical activity.

This study also identified factors associated with physical inactivity. Female participants were more likely to be inactive than males. This finding was consistent with studies conducted in Brazil, Malaysia, Japan, Poland, China, Saudi Arabia, India, South Africa and Nigeria [6, 7, 13, 18, 20–22, 24–26]. This similarity might be due to females' greater involvement in light work, which makes them more inactive as compared to males [7, 13, 18, 22].

Older adults were more likely to be inactive as compared to younger adults. This result was consistent with study reported from Malaysia, South Africa, Mexico and South-East Asia [7, 10, 17, 27]. The similarity might be due to limited physical activity interventions for older adults in many countries. Conversely, this result was unlike a study conducted in Nigeria [18]. The possible reason might be due to addiction to screen-based view such as a smart phone, a computer, television and the like among young adults.

This study revealed that adults with high monthly incomes were more likely to be inactive than those with low monthly incomes. This finding was consistent with studies done in China and Malaysia [6, 7]. The similarity might be due to more inactive lifestyles among high income adults [7]. Conversely, this finding was unlike studies from Nigeria and Japan [11, 25]. The reason might be due to more engagement in recreational activities among high income adults [11].

This study found that adults who had no information about physical activity guidelines were more likely to be inactive than the informed ones. This finding was consistent with a study done in southwest Ethiopia [14]. The reason might be due to limited physical activity information in the country.

According to this study, privately employed adults were less likely to be inactive as compared to the unemployed. This result was similar to a study conducted in Saudi Arabia and South-East Asia [22, 27]. In the Ethiopian context, unemployed adults spent more time sitting at home, which leads to being physically inactive. On the other hand, this finding was unlike a study conducted in Malaysia which revealed that privately employed were more likely to be physically inactive than those employed by the government [7]. This might be a result of high work burden on the privately employed that does not encourage to be active [7].

Though this study has significant findings, there are some limitations that need to be recognized. Firstly, this study used a self-report method in which participants may overestimate their physical activity level. Secondly, a cause-effect relationship was not established due to the nature of a cross-sectional study design. Lastly, the findings of this study were not compared with studies conducted in Ethiopia due to limited literature on physical activity in the country. Despite these limitations, this study was conducted using the standard questionnaire and analysis guideline that need to be considered as its strength. Using this study as preliminary information, future studies should consider objectively measured methods.

CONSLUSION

This study revealed high prevalence of physical inactivity among adults in the Harar town. Almost half of the adult population is physically inactive. The majority of adult population had no information about physical activity guidelines. Moreover, this study identified different factors significantly associated with physical inactivity. As a result, the majority of adults in the study area would be at a greater risk of developing non-communicable diseases. Thus, immediate actions are suggested with community based physical activity interventions.

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