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Civil servants' physical activity status and its associated factors in Northeast Ethiopia: applying Health Belief Model

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ABSTRACT

Background Identifying the associated factors of the physical activity of civil servants is necessary to increase the practice of physical activity. However, limited studies addressed associated factors of civil servants' physical activity status in Ethiopia. Hence, this study assessed civil servants' physical activity status and associated factors in Northeast Ethiopia.

Methods An institution-based cross-sectional study design was conducted from 28 February to 13 March 2020 and measured physical activity using WHO physical activity definition. Four hundred and eight civil servants were interviewed using a systematic random sampling technique. A descriptive statistics and multivariable logistic regression model were used.

Result The percentage of physical activity for the civil servants of the study was only 2.38, with the prevalence of physical activity status of 64.0% (95% CI 60.4% to 67.61%). Perceived self-efficacy (adjusted OR (AOR)=1.98, 95% CI 1.15 to 4.12), cues to action (AOR=2.12, 95% CI 1.04 to 3.22) and being a health professional (AOR=2.19, 95% CI 1.13, 4.23) were main associated factors of physical activity. However, physical activity was not affected by respondents' sex (AOR=1.01, 95% CI 0.67 to 1.83), educational status (AOR=0.23, 95% CI 0.03 to 1.91), perceived barrier (AOR=0.97, 95% CI 0.91 to 1.04) or perceived benefit (AOR=1.02, 95% CI 0.95 to 1.09).

Conclusion The health profession, self-efficacy and cues to action were the main associated factors of physical activity. Hence, the Sports Bureau and Health Bureau should pay attention to providing information by focusing on improving self-confidence and creating a positive attitude toward physical activity.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Physical activity has many health benefits. Sufficient activity positively affects body composition and musculoskeletal development, it reduces the risk of multiple non-communicable diseases heart disease and it improves an individual's general well-being. Yet, most research on population activity levels stem from studies in western cultures.

WHAT THIS STUDY ADDS

⇒ Our study describes the physical activity and adds a detailed understanding of factors associated with the physical activity of Ethiopian civil servants.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Our results provide guidance for the development of policy and the design of training programmes and interventions to positively affect physical activity, specifically targeted at Ethiopian civil servants.

BACKGROUND

Physical activity is any body movement produced by skeletal muscles that require energy expenditure. Popular ways of physical activity to be active include walking, cycling, wheeling, sports, active recreation and play. It can be done at any level of skill and for enjoyment by everybody. Globally, one in four adults does not currently meet the recommendations for physical activity stated by WHO.[1] About 40% of adults in Africa were physically inactive.[2 3] In Ethiopia, physical inactivity accounts for only 6% of the general population.[4 5] However, less than 50% of Ethiopian civil servants fulfilled WHO recommendations for physical activity.[6 7]

Physical activity can be affected by demographic, cultural, psychological, behavioural, biomedical and environmental factors.[8] Studies suggest that female respondents perform low physical activity compared to male respondents[9–11]; similarly, older aged and higher income was not met recommended physical activity.[9 12–14] The lower level of perceived severity, perceived benefit, self-efficacy and cues to action were also factors for physical inactivity.[13 15–19]

Studies recommended regular physical activity to prevent and control non-communicable disease (NCD) related morbidity and mortality.[1 20 21] However, population groups, like civil servants, tend to be less physically active.[6]

Physical inactivity was responsible for economic loss (accounts for 1%–3% of national healthcare costs),[22] and it is also associated with NCDs, which caused 71% of

global deaths, 22% of African premature adult deaths and 39% of all Ethiopian deaths in 2016.[23 24]

In Ethiopia, disease epidemiology is becoming a double burden (communicable and non-communicable).[25 26]

Sustainable development goal was set to reduce premature mortality from NCDs through prevention and treatment by one-third by 2030.[27] Additionally, the Ethiopian health sector transformation plan and national strategic action plan for prevention and control of NCDs target to reduce NCD-associated morbidity and mortality.[28 29]

Practising moderate and/or vigorous physical activity plays a crucial role in achieving these targets, especially for civil servants, due to their routine work.

In Ethiopia, some studies assessed the prevalence and factors of physical activity among general populations.[4 6 30] However, limited studies addressed the physical activity statuses of civil servants, especially in the study area. Moreover, none of those studies identified behavioural factors using the behavioural model as a conceptual framework. Therefore, this study assessed physical activity practice and identified behavioural factors using Health Belief Model (HBM) among civil servants.

METHODS

Study design and area

An institutional-based cross-sectional study des conducted in Antsokia, North Shoa Zone, Amhara Region, from 28 February to 13 March 2020. Antsokia is 400 km north of Addis Ababa, the capital city of Ethiopia. One thousand five hundred and ten civil servants are employed among 25 governmental sector offices and provide different services for the district. The town of the district has one public sports place for residents.

Source and study population

Source population

The source population was all civil servants in Antsokia district.

Study population

Selected civil servants were the study population during the study period.

Inclusion and exclusion criteria

Inclusion

Any civil servant 18 years or older and those who lived more than 6 months in the district were included.

Exclusion criteria

Civil servants with a known disease or physical disability that limited physical activity were excluded from the study.

Operational definition

Physical activity:achieving at least 600 MET (maximum exercise per time) by practising at least 150 min of moderate physical activity and/or at least 75 min vigorous activity was considered as physically active, and practising moderate physical activity less than 150 min and/or 75 min vigorous activity throughout the week was considered as physically inactive. Following the International Physical Activity Questionnaire (IPAQ), practising at least 3000 MET was considered highly physically active; at least 600 MET was medium physically active while practising for less than 600 MET was considered inactive.

Perceived susceptibility: was measured by a summed score of items, approaching the maximum sum scores considered as high influence and to minimum sum scores as having a low influence on physical activity of civil servants with reference to 7 practices questionnaire regarding the prevention of NCD (hypertension, diabetes mellitus, cancer and others) by using a 5-point scale.

Perceived severity: was measured by a summed score of items, approaching the maximum sum scores considered as high influence and to minimum sum scores as having low influence on physical activity of civil servants with reference to five practices questionnaire regarding complications of facing NCD using a five-point scale.

Perceived benefit: was measured by a summed score of items focusing on the benefits of practising physical activity (PA) and approaching the maximum sum scores considered as high influence and minimum sum scores as having low influence on physical activity of civil servants with a reference of five questionnaires regarding on minimisation of different health problem by using a five-point scale.

Perceived barrier: was measured by a summed score of items focusing on barriers to practice PA and approaching the maximum sum scores considered as high influence and to minimum sum scores as having low influence on physical activity of civil servants with a reference of six questionnaires regarding on threat of physical activity by using a five-point scale.

Self-efficacy: was measured by a summed score of items focusing on self-confidence to practice PA and approaching the maximum sum scores considered as high influence and to minimum sum scores as having low influence on physical activity of civil servants with a reference of five practices questionnaire using a five-point scale.

Cues to action: were measured by a summed score of items focusing on motivators to practice PA and approaching the maximum sum scores considered as high influence and to minimum sum scores as having low influence on physical activity of civil servants with a reference of five practices questionnaire using a five-point scale.

Sample size determination and sampling technique

The calculated sample was 408 considering (p=40.9%) from a previous study,[7] level of confidence = 95% and marginal error = 0.05, including a 10% non-response rate. Lists of total civil servants were obtained from Antsokia civil service office, and the sampling frame was prepared using the alphabetical order of their names. Then, we used a systematic random sampling technique

to select study participants by calculating the selection interval\Kth interval\(total population/minimum sample size (1510/408=3.7)). The first participant was selected through the lottery method, and then we selected at every four intervals.

Data collection and measurement

Using a pretested, structured, self-administered questionnaire, participants were interviewed in Amharic (local language). The questionnaire was adapted from the IPAQ[31] and items for HBM constructs (perceived susceptibility, perceived severity, perceived benefit, perceived barriers, cues to action and self-efficacy) from previous literature.[19 32 33] The questionnaire included sociodemographic variables, the physical activity status of civil servants and the Health Belief Model Contract of physical activity. The data were collected by six college-completing BSc nurses in the selected participant office, and the principal investigator supervised the data collection process. The training was given to data collectors about the data collection tool, how to collect data and taking consent to having a common understanding.

The physical activity status was assessed using six questions. The perceived susceptibility part consisted of 7 items in 5-point Likert scale and the score of individuals for each item was summed up ranging from 7 minimum to 35 maximum total scores, perceived severity consisted 5-point Likert scale items and the score of individuals for each item was summed up ranging from 5 minimum to 25 maximum total score, perceived benefit consisted 5-point Likert scale items and the score of individuals for each item was summed up ranging from 5 minimum to 25 maximum total score, perceived barriers consisted of 6 items with 5-point Likert scale and the score of individuals for each item were summed up ranging from 6 minimum to 30 maximum total score, cues to action consisted of 5 items in 5-point Likert scale and the score of individuals for each item were summed up ranging from 5 minimum to 25 maximum total score and self-efficacy consisted of 5 items in 5-point Likert scale and the score of individuals for each item were summed up ranging from 5 minimum to 25 maximum total score.

For all constructs, the sum of the score of individuals for each item was summed up after reverse coding for negatively worded items. All constructs were treated as continuous variables for analysis.

The questionnaire was translated from English to the local language (Amharic) and translated back to English by another individual to check the consistency. It was pretested on 5% (21) related participants in Kemisse town, which is 12 km far from the study area, before the actual data collection period. The reliability test was checked using Cronbach's α of 0.7 as a cut-off point, and multicollinearity between independent variables was also checked.

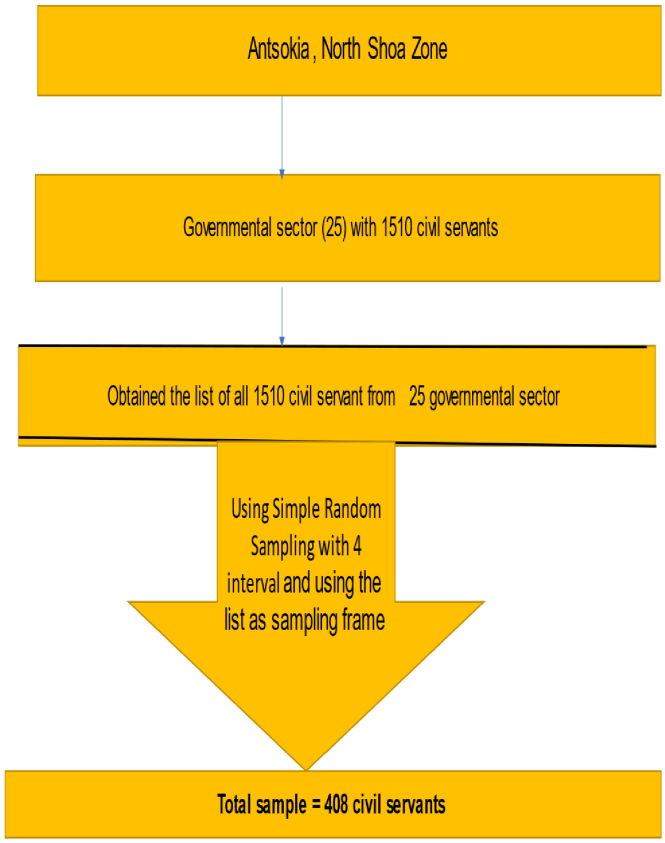

Figure 1 The flow chart of the study.

Data management and analysis

The data were checked, coded and entered using Epi Data software V.3.1 (Epi Data Association, Odense, Denmark) and exported to SPSS software V.23 for further analysis. The descriptive result was presented using frequency and proportions for all variables, and a bivariable regression analysis was performed to determine the association between individual factors and physical activity status at a 95% CI and a p value of <0.2. To identify the independently associated factors of physical activity status, multivariable logistic regressions were performed, and variables with a p valueof <0.05 were considered statistically significant associated factors of outcome variables. The goodness of fit of the final model was checked using the Hosmer and Lemeshow test of goodness of fit, and the result was 0.69.

RESULTS

Flow chart of the study

Here, the figure shows how the inclusion went from the '1510 civil servants employed among 25 governmental sector offices' to the 408 participants finally interviewed (figure 1).

Sociodemographic characteristics

Three hundred and eighty nine participants were interviewed from 28 February to 13 March 2020, with a response rate of 95.3%. Of the interviewed participants, 286 (73.5%) were males,184 (47.3%) participants were

Table 1 Sociodemographic characteristics of study participants at Antsokia, North Shoa Ethiopia, 2020 (N=389)

Variables	Frequency	Per cent
Sex		
Male	286	73.5
Female	103	26.5
Residence		
Urban	296	76.1
Rural	93	23.9
Marital status		
Married	184	47.3
Single	183	47
Divorced	21	5.4
Widowed	1	0.3
Educational status		
Diploma and below	148	38
Degree	232	59.6
Master's and above	9	2.3
Profession		
Health	61	15.7
Non- health	328	84.3
Family history of NCD		
Yes	51	13
No	338	87

NCD, non-communicable disease.

Table 2 The bivariable binary logistic regression analysis of factors associated with physical activity status in Antsokia, Northeast Ethiopia, 2020

Variables	COR (95% CI)	P value
Sex		0.001
Male	1	
Female	1.48 (0.93 to 2.34)	
Educational status		
Master and above	1	
Diploma and below	0.19 (0.02 to 1.55)	<0.001
Degree	0.24 (0.03 to 1.93)	<0.001
Profession		0.006
Non-health	1.89 (1.01 to 3.52)	
Health	1	
Age		0.025
<15 years	4.15 (2.44 to 7.06)	
15–65 years	1	
≥65 years	5.70 (2.56 to 12.71)	
Perceived benefit	1.09 (1.03 to 1.16)	<0.001
Perceived barrier	0.93 (0.88 to 0.99)	0.001
Self-efficacy	1.65 (1.21 to 3.15)	<0.001
Residence		0.080
Rural	2.12 (0.92 to 4.85)	
Urban	1	
Cues to action	2.17 (1.09 to 1.26)	0.006
The family history of NCD		
Yes	1	0.026
No	3.04 (1.92 to 4.82)	

COR, crude odds ration; NCD, non-communicable disease.

married, 61 (15.7%) were health professionals and 51 (13%) participants had a family history of NCD. The mean age of the respondents was 30 years old with SD ±6.5 years (table 1).

Physical activity status and HBM constructs

Of the participants, only 64% (95% CI 60.4% to 67.61%) were physically active. Two hundred and five (82.3%) of the individuals who were physically active in the study did so at a moderate level, while 44 (17.7%) did it at a high level. For each construct of the Health Belief Model, which was framed around physical activity, respondents' mean score was computed. Consequently, the mean scores were 19.4±4.2 (range of possible values: 7–35) for perceived susceptibility, 14.9±2.8 (range of possible values: 5–25) for perceived severity, 14.4±3.6 (range of possible values: 5–25) for perceived barriers, 20.4±3.5 (range of possible values: 6–30) for perceived benefit, 17.7±3.1 (range of possible values: 5–25) for the cue to action and 18.3±3.8 (range of possible values: 5–25) for self-efficacy. The Cronbach's α of each construct was above 0.7.

Associated factors of physical activity status

The relationship between physical activity status and predictor variables was first assessed through bivariable analysis. In this analysis, the sex of respondents, profession, educational status, perceived barriers, perceived benefit, self-efficacy and cues to action were significantly associated with physical activity status at a 20% significance level (table 2). However, in a multivariable logistic regression, only profession, self-efficacy and cues to action were significantly associated with physical activity at $\alpha = 0.05$.

Accordingly, health professionals were 2.19 times (AOR=2.19; 95% CI 1.13 to 4.23) more likely to be physically active than non-health professionals. For every one-point increase in the self-efficacy sum score, the odds of physical activity were increased by 1.98 (AOR=1.98; 95% CI 1.15 to 4.12). Likewise, a unit increase in the cues-to-action sum of the score also increases the odds of physical activity by 2.12 (AOR=2.12; 95% CI 1.04 to 3.22) (table 3).

DISCUSSION

This study provides insight into the habit of physical activity of civil servants in Northern Ethiopia. WHO

Table 3 Factors associated with physical activity status in Antsokia, Northeast Ethiopia, 2020

Variable	Physical activity		COR (95% CI)	AOR (95% CI)
	Active	Inactive		
Sex				
Female	59	44	1	1
Male	190	96	1.48 (0.93 to 2.34)	1.01 (0.67 to 1.83)
Educational status				
Master and above	8	01	1	1
Diploma and below	89	59	0.19 (0.02 to 1.55)	0.23 (0.03 to 1.91)
Degree	152	80	0.24 (0.03 to 1.93)	0.33 (0.04 to 2.80)
Profession				
Non-health	203	125	1	1
Health	46	15	1.89 (1.01 to 3.52)	**2.19 (1.13 to 4.23)***
Perceived benefit	Mean=20.4±3.5		1.09 (1.03 to 1.16)	1.02 (0.95 to 1.09)
Perceived barrier	Mean=14.4±3.6		0.93 (0.88 to 0.99)	0.97 (0.91 to 1.04)
Self-efficacy	Mean=18.3±3.8		1.65 (1.21 to 3.15)	**1.98 (1.15 to 4.12)***
Cues to action	Mean=17.7±3.1		2.17 (1.09 to 1.26)	**2.12 (1.04 to 3.22)***

*Bold indicates significance at p <0.05.
AOR, adjusted OR; COR, crude odds ration.

recommended that a physically active individual achieve at least 600 MET.[34] According to the WHO recommendations, 64% of the civil servants were physically active in this study. The current study finding is higher than studies conducted in Ethiopia, Addis Ababa (51.8%)[17] and Ambo (40.9%).[18] The difference could be the inclusion of rural area civil servants in this study. Rural civil servants might not have transport access, and due to this reason, they used food and bicycles.

However, this finding is lower than studies conducted in Tanzania (96%),[14] Nigeria (68.6%),[15] Canada (75%)[12] and China (93%).[35] The possible explanation for this difference could be the inaccessibility of sports fields, the lack of an extensive awareness campaign about the benefit of physical exercise and poor attention by concerned government bodies in this study.

In this study, physical activity was more likely among health professionals than non-health professionals. This finding aligned with a study conducted in Turkey, where walking activities were significantly higher among health professionals than among teachers.[36] Moreover, a study conducted in Malaysia supported this study finding that medical staff were more likely to be physically active than non-medical staff.[37] The consistency of the current and previous studies might be due to the presence of knowledge and positive attitudes about the effect of physical activity on health promotion, disease prevention and treatment among health professionals.

Self-efficacy was positively and significantly associated with physical activity in the current study; participants with a higher score in self-efficacy were more likely to practice physical activity. This finding aligns with studies conducted in Iran, China and Poland.[13 16–18] This implies that, as HBM stated, whenever an individual has higher confidence to perform the behaviour, ending with the practice is more likely.[33]

The other important construct of this study was respondents who had higher scores of cues to action were more likely to practice physical activity. This finding was consistent with studies conducted in Indonesia[15] and the USA,[19] in which direct associations were observed between cues to action and physical activity. This implies that, as HBM stated, getting the external motivation to practice behaviour could improve the practice.[33]

Health Belief Model explained 13.8% of the variance for physical activity. It was lower than studies conducted in Iran at 33%[38] and in Poland, where HBM explained 24% of the variance for vigorous physical activity but higher than the variance for moderate physical activity, which was 4% in this similar study.[17]

Based on this and previous studies, self-efficacy and cues to action seem to be important factors of physical activity and focusing on improving self-confidence and motivation will have a higher effect on promoting physical activity.

As a limitation, even if the Health Belief Model is used, only distal factors (perception) of physical activity were identified. However, proximal factors like environmental factors were not addressed, and another limitation was the study being conducted in a single district due to budget and time constraints.

CONCLUSIONS

The percentage of civil servants engaged in physical activity was low. As a health professional, self-efficacy and cues to action were identified as the main contributing

factors to increased physical activity. This study recommends researchers apply other behavioural models and identify immediately associated factors like attitude, intention and environmental factors.

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Competing interests None declared.

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Patient consent for publication Not applicable.

Ethics approval This study involves human participants. Ethical clearance was obtained from the institutional review board of the College of Medicine and Health Sciences, Bahir Dar University. An official support letter was obtained from Amhara Public Health Institute. Written consent was obtained from the participants after informing them all purpose, benefits and risks of the study and that the procedures complied with the Declaration of Helsinki. Participants gave informed consent to participate in the study before taking part.

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Data availability statement Data are available upon reasonable request.

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