
**COLLEGE OF HEALTH SCIENCE**

**SCHOOL OF NURSING AND MIDWIFERY**

**NURSING DEPARTMENT**

# PHYSICAL ACTIVITY STATUS AND FACTORS AFFECTING IT AMONG NURSES WORKING AT SELECTED PUBLIC HOSPITALS, ADDIS ABABA, ETHIOPIA, 2024: A Cross-Sectional Study.

By: Samrawit Tariku

Primary advisor- Yohannes Ayalew

Co-advisor- Sr. Tsion Alemu

**A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, THE DEPARTMENT OF NURSING, SCHOOL OF NURSING AND MIDWIFERY, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN ADULT HEALTH NURSING.**

May, 2024

Addis Ababa, Ethiopia

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**APPROVAL SHEET**

**ADDS ABABA UNIVERSITY**

**COLLEGE HEALTH SCIENCE OF SCHOOL OF NURSING AND MIDWIFERY**

I, the undersigned MSc student, declare that I have submitted my original work on the title Physical Activity Status and Factors Affecting It among nurses working at selected public hospitals, in Addis Ababa, Ethiopia, 2024 for the examination.

**Submitted by:**

Samrawit Tariku _____ _____

Name of student Signature Date

This thesis work has been submitted for examination with my approval as an advisor.

Approved by:

_____ _____ _____

Name of Major Advisor Signature Date

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## APPROVAL BY THE BOARD OF EXAMINATION

This thesis by Samrawit Tariku is accepted in its present form by the board of examiners as satisfying the thesis requirement for the degree of Master in Adult Health Nursing

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By my signature below, I declare and affirm that this thesis is my work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis, and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

This thesis is submitted in partial fulfillment of the requirement for a graduate degree from Addis Ababa University at the College of Health Sciences, School of Nursing and Midwifery. The thesis is deposited in the Addis Ababa University Digital Library and is made available to the local, national, and international scientific community. I solemnly declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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# ACKNOWLEDGMENT

First, I would like to thank Almighty God for keeping me alive, safe, and protected during this thesis. Then my sincere gratitude goes to Dire Dawa University for giving me the scholarship and to my advisor Mr. Yohannes Ayalew and my co-advisor Sr. Tsion Alemu for their valuable patience and feedback during the thesis writing.

Nobody has been more important to me in the pursuit of this report than the members of my family. I would like to thank my parents and spouse. Their belief in me has kept my spirit and my motivation high during this report. I would also like to thank my daughters for keeping me entertained.

# ACRONYMS/ABBREVIATION

CI – Confidence Interval

EHIS-PAQ – European Health Interview Survey Physical Activity Questionnaire

ETB – Ethiopian Birr

HCP – HealthCare Professionals

NCDs – Non-communicable Diseases

NIH – National Institutes of Health

MET –Metabolic Equivalent of Task

OR – Odds Ratio

PA – Physical Activity

PAG –Physical Activity Guidelines

SPHMMC – Saint Paul's Hospital Millennium Medical College

SPSS – Statistical Product and Service Solutions

TASH – Tikur Anbessa Specialized Hospital

OPD – Out Patient Department

IPD – In-Patient Department

ICU – Intensive Care Unit

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## ABSTRACT

**Background**: These days, engaging in sufficient regular physical activity is strongly recommended for good health and physical functioning. Physical activity can increase the self-confidence of the health professionals and they would become fit for daily activities with patients.

**Objective:** This study was to measure the level of physical activity and identify affecting factors among nurses in selected public hospitals in Addis Ababa, Ethiopia in 2024.

**Methods**: An institution-based cross-sectional study was conducted to assess the level of physical activity and associated factors. Four public hospitals were selected by lottery method from 13 public hospitals and the sample size was distributed proportionally depending on the number of nurses in each hospital, then by using convenience sampling nurses were selected for data collection at each hospital. The total sample size was 353, the global physical activity questionnaire was used to measure the level of physical activity. Using SPSS version 27, descriptive statistics and binary logistic regression analyses were done to affirm the variables' characteristics.

**Results:** 316 respondents replied with a response rate of 90%. The majority of the respondents were female which accounts for 206 (65.2%), mean age was 29.14, 185 (58.5%) were single, and 167 (52.2%) nurses worked on IPD. In general, the majority of the study participants, 81.2% achieved recommended levels of physical activity. Respondents nurses whose behavior not drinking alcohol were 2.416 times more likely to engage in physical activity compared with alcohol-drinking behavior [AOR=2.416; 95% CI=1.148 - 5.086]. The study showed that respondents who spent time by sitting less than 4 hours were 0.404 times less likely to engage in physical activity compared to those who spent time by sitting more than 4 hours [AOR=0.404; 95% CI= 0.221 - 0.740].

**Conclusions:** Nurses' habits of physical activity improved as compared with the previous studies. However, the current level of physical activity of health professionals is not adequate. nurses' age, and self-motivation attribute to physical activity. The level of physical activity can be increased by enhancing staff motivation towards physical activity.



**Keywords**– Physical activity, Nurses, Public Hospital, Addis Ababa, Ethiopia.

# 1. INTRODUCTION

## 1.1. Background

Physical activity (PA) is any movement of skeletal muscles that requires more energy than resting. (1). This encompasses various activities, from recreational pursuits to transportation and job-related tasks (2). It improves general health and reduces the chance of developing non-communicable diseases (NCDs) (3). Engaging in physical activity has numerous health benefits, including improving respiratory and muscular fitness, bone health, assisting in keeping a healthy weight, mental well-being, and reducing the risk of various diseases such as depression, diabetes, hypertension, coronary heart disease, stroke, and certain cancers (4).

Statistics reveal a concerning trend of insufficient physical activity globally. Approximately 1.4 billion adults, representing over a quarter of the adult population worldwide, do not meet recommended activity levels. This lack of physical activity contributes significantly to non-communicable diseases (NCDs), with physically inactive individuals facing a higher risk of premature death compared to those who are active (5). NCDs are responsible for millions of deaths annually, with cardiovascular diseases being the leading cause followed by cancer, chronic respiratory diseases, and diabetes (6).

The World Health Organization (WHO) recommends specific guidelines for adults to achieve significant health benefits through physical activity. These guidelines include engaging in at least 150-300 minutes of moderate-intensity aerobic exercise, 75-150 minutes of vigorous-intensity aerobic exercise, or a comparable mixture of moderate and vigorous-intensity aerobic activity throughout the week, along with moderate-to-intense exercises that strengthen and target the main muscle groups two or more times per week to obtain extra health advantages (7). Similarly, Canada's recommendations for physical activity emphasize the importance of combining aerobic and strength-building exercises to maintain good health (8).

Nurses are at the forefront unsung heroes of primary healthcare delivery who play a crucial role in healthcare delivery across diverse settings and possess valuable knowledge about health behaviors, including the importance of physical activity (9). Despite this knowledge, nurses often report poorer health outcomes and engage in unhealthy habits like smoking, poor diet, and physical inactivity compared to non-nurses (10). Various barriers hinder nurses from engaging

in regular physical activity, such as time constraints, fatigue, family responsibilities, work schedules (stress), financial costs, body image concerns, lack of social support, and insufficient knowledge about appropriate exercise levels (11).

It is crucial for nurses to maintain a certain level of physical fitness to effectively carry out their daily duties like walking to their designated patients during a shift, helping and transferring patients, and transporting equipment, which often involves light-intensity physical exertion (12,13). An activity that is categorized as less than three metabolic equivalent of tasks (METs) is considered to be light-intensity and involves less work than moderate and vigorous ones and it includes things like sitting at a computer, eating, cooking, cleaning dishes, making the bed, and taking a slow walk (like going shopping or around the office) (14,15).

However, research shows that nurses are more likely to be overweight or obese compared to other healthcare professionals and individuals in non-health-related professions. This increased weight can lead to various health issues such as musculoskeletal problems, diabetes, heart disease, osteoarthritis, and cancer (16).

The prevalence of obesity and physical inactivity among nurses is influenced by occupational factors, including long work hours, high job demands, and stressful work environments. Nurses working in such conditions may find it challenging to engage in regular physical activity and may take longer to recover from work-related stress (17).

Furthermore, urban planning and rapid urbanization can contribute to unhealthy environments that exacerbate the prevalence of infectious diseases and non-communicable diseases (NCDs) (18). The advancement of technology in modern society has also led to a decline in physical activity levels, impacting overall fitness and health outcomes (19). To address these issues, the World Health Organization (WHO) has set global targets to reduce physical inactivity by 15% by the end of 2030 through its global action plan on physical activity (20).

Addressing barriers and promoting physical activity among nurses is essential to improve their overall well-being and set a positive example for patients and communities. By prioritizing their health and wellness, nurses can enhance their ability to provide high-quality care and contribute to disease prevention and health promotion efforts effectively.

## 1.2 Statement of the problem

Sedentary behaviors and physical inactivity have increased in modern lifestyles, including work-related, home-based, and screen-based recreational activities. This has been linked to the beginning of chronic illness (1).

The World Health Organization estimated that individuals who are not active enough have a 20% to 30% higher risk of dying compared to those who are sufficiently active. Additionally, 17 million people die from non-communicable diseases before they reach 70 years old every year. Furthermore, physical inactivity is a major risk factor for dying from non-communicable diseases (5). Of these premature fatalities, 86% occur in low- and middle-income countries and 77% are related to NCDs (6). Ethiopia is also one of the low-income nations in the world (21).

Inadequate physical activity is one of the modifiable risk factors of the foundational NCDs. This invisible epidemic is a major contributor to poverty and a hindrance to the economic development of many countries. There is an increasing number of people, families, and communities bearing the brunt of the burden (22).

The majority of nursing work involved light-intensity physical activity; mostly of standing or walking while performing direct patient care duties (13). Due to this, nurses are much more likely to be overweight or obese than other medical professionals and people in non-health-related jobs (16). Obesity and physical inactivity among nurses are significantly influenced by occupational factors. Previous research has indicated that nurses face difficulties in engaging in the moderate to intense physical activity that is advised to maintain optimal health because of their long shifts, cramped quarters, and lack of access to fitness centers (23). Also, nurses who work in extremely stressful environments take longer to recover and are less likely to exercise (17).

Nearly 60% of participant nurses' physical activity status did not meet the 2018 physical activity guidelines (PAGs) in the United States of America (10). In Johnsburg, nurses received the lowest scores for physical activity practices (24). Also in Ethiopia, there is no specific information about nurses but in general health professionals met 89.2% that of the recommended levels of physical activity (25).

Healthcare professional's (HCPs) behavior has a significant impact on patients and the general public, so it is important to be concerned about their behavior. They must take responsibility for their health since they are the gatekeepers of patient and public health. They should be leading the way of motivating and properly suggesting patients to participate in PA (26). In addition, patients view medical professionals as the primary trustworthy information source when making decisions supporting a healthy lifestyle. (8).

Their lifestyle may affect the attitudes and counseling of others. Because they are the front-line providers of public health services, nurses have thus played a crucial role in increasing public awareness of the benefits of physical activity. Evidence shows that nurses interact with patients frequently and are uniquely positioned to promote physical exercise. (27). As a result, nurses ought to start exercising before persuading others. Nevertheless, no information is currently accessible about the status and factors affecting physical activity among nurses in Addis Ababa, Ethiopia. Therefore, this study aims to understand the physical activity status of nurses and the factors affecting it.

## 1.3 Significance of the study

This research would have to identify the status of physical activity among nurses working in Tikur Anbessa Specialized Hospital (TASH), Alert Hospital, Yekatit 12 Hospital, and St. Paul Hospital Millennium Medical College (SPHMMC), Addis Ababa, Ethiopia. The study would have to show the status and factors affecting physical activity among nurses. It has a significant impact on various stakeholders. For nurses, it can help them identify areas for improvement and develop strategies to enhance their overall health and well-being, leading to increased job satisfaction and reduced burnout. This, in turn, can potentially improve work performance and reduce absenteeism, ultimately benefiting hospitals by enhancing patient care outcomes. Furthermore, it can inform the development of workplace policies and initiatives that support a more active lifestyle for healthcare workers. Hospitals can consider providing access to fitness facilities, offering wellness programs, or implementing walking breaks during shifts to encourage physical activity among staff. These initiatives can make an impact to creating a healthier and more productive workforce.

For policymakers, such as the Ministry of Health and regional health bureaus, it can be a priority to ensure the well-being of healthcare workers and improve patient care quality. They can take action to encourage physical activity at the workplace, such as designing and building gymnastics or sports clubs in health institutions. Lastly, it can serve as valuable background information for future research. Overall, the study can benefit individuals, hospitals, policymakers, and researchers alike.

## 1.4 Limitations of the Study

Data collection was very difficult because most of the participants were not cooperative when the data was being collected and time constrains. Due to that, I can only collect 90% of the total sample size. The current study includes the general hospital found in the urban area. This might increase the level of the recommended level of physical activity as this is self-reported data, and participants may overestimate their PA status. The method of data collection is open to self-reported and social desirability bias that may affect the result. Further studies on wider and more representative samples could yield valid and reliable findings.

# 2. LITERATURE REVIEW

This literature review addressed various studies on the status of and factors affecting physical activity among nurses conducted in various countries as there is not enough information in Ethiopia. This review includes information about the status of physical activity, as well as factors affecting it and a conceptual framework. I have used different journals but most of the literature is from PubMed and Google Scholar.

## 2.1. Status of physical activity among nurses

A seven-day investigation regarding the physical activity of sixty-two American nursing staff found that the participants did 303.0±58.8 minutes of light-intensity activity, 10.8±9.0 minutes of moderate-intensity activity, and 9.6±11.4 minutes of high-intensity activity. Surprisingly, although 58.1% of participants reported that their organization promoted physical activity at work (10).

In an American NIH clinical center investigation, 335 people (24.6%) clicked on the link and filled out the questionnaire. Furthermore, among the 304 nurses, the majority reported moderate (107 or 35.2%) or high (114 or 37.5%) degree of physical activity. Of the nurses who participated in moderate exercise, 35 (29.7%) were registered nurses providing direct care; the remaining nurses were registered nurses providing non-direct care. 50 (42.4%) licensed nurse practitioners provided direct care, and 64 (34.4%) licensed nurse practitioners provided non-direct care, out of the nurses that worked in high physical activity. 81% of the individuals said they were "sedentary," spending a median of six hours a day sitting down (31).

In order to ascertain the importance of physical exercise in daily life, research was conducted on 279 nurses in France. The bulk of the activities performed by nurses are linked to nursing. Sports, housework, and transportation physical activity all have comparable percentages—17.0%, 19.8%, and 20.3%, respectively. The majority of subjects showed moderate activity (18.9%) or high activity (75.4%). Just 5.7% would be considered to have a low PA level (32).

A Spanish study of 647 health professionals working in public and private settings found that 187 (28.9%) of them were nurses, 216 of them were men and 166 of them were women. Of the

187 nurses, 93.72% have engaged in total PA and 90.37% have engaged in work-related physical activity (WRPA). (33).

A study conducted in Taiwan on public health nurses discovered that, of 172 nurses, sixty-eight (39.54%) reported doing vigorous physical activity in the preceding seven days, with an average of 0.97 days; 85 (49.42%) reported doing moderate physical exercise, with 1.43 days on average; and 123 people (71.51%) said they walked for ten minutes per day on average 2.49 days a week. The average daily sedentary time for the respondents during the study period was 8.05 hours (34).

### 2.2. Factors affecting physical activity among nurses

Out of the 412 participants who responded to the study on the prevalence and predictors of physical activity among nurses at Riyadh, and Beirut, 248 (60.2%) of them routinely work out. Physical activity was independently connected with smoking and maintaining a healthy weight, according to multivariate analysis. Compared to smokers, non-smoker respondents' physical activity is considerably more (odds ratio [OR]=1.61; 95.0% CI [1.43 – 2.85]) (23).

In a study conducted in Taiwan on physical activity and influencing factors, regular aerobic physical activities (46.8% vs. 24.6%; OR = 0.36; 95% CI = [0.20, 0.67]) and muscle strengthening (62.7% vs. 40.3%; OR = 0.42; 95% CI = [0.24, 0.73]) (34).

According to a study in Poland, in contrast to nurses who work in non-management roles, those in managerial roles demonstrated a lower work-related PA ($p = 0.028$; $Z = -2.2$). Hospital ward nurses exhibited the highest level of work-related PA, and they were more active than district nurses ($p = 0.001$) and outpatient clinic nurses ($p = 0.004$). Nurses who worked in many locations demonstrated greater levels of PA connected to their jobs than nurses who worked in a single location ($p = 0.027$; $Z = -2.2$). According to the study's findings, professionally practicing nurses have a high level of PA (32).

The research of prevalence and predictors of physical activity among nurses in Perak, Malaysia the logistic regression analysis of various variables with physical activity levels among participants. Self-reported health status was the only variable that was significantly associated with physical activity level. It was found that participants with alcohol consumption status were

1.84 times less likely to engage in physical activity (p = 0.036, CI = 1.04–3.24). On the other hand, although occupational status showed no significant association with physical activity levels, a comparison between groups showed that support workers are more likely to engage in physical activity compared to professional groups (p = 0.025, CI = 0.15–0.88) (39).

The studies mentioned provide insights into the status of physical activity among nurses in different countries and settings. Overall, the findings suggest that a significant portion of nurses engage in physical activity, with varying levels of intensity and frequency. Factors such as workplace policies, and personal habits like smoking, and drinking can influence nurses' participation in physical activity.

## 2.3. Conceptual Framework

As seen in Figure 1 below, this conceptual framework demonstrates the relationship between the independent variables and the dependent variable of their physical activity level. After analyzing several types of literature about the sociodemographic, behavioral and work-place related characteristics of the research population, this conceptual framework was selected. (10,23,31,32,33,34)

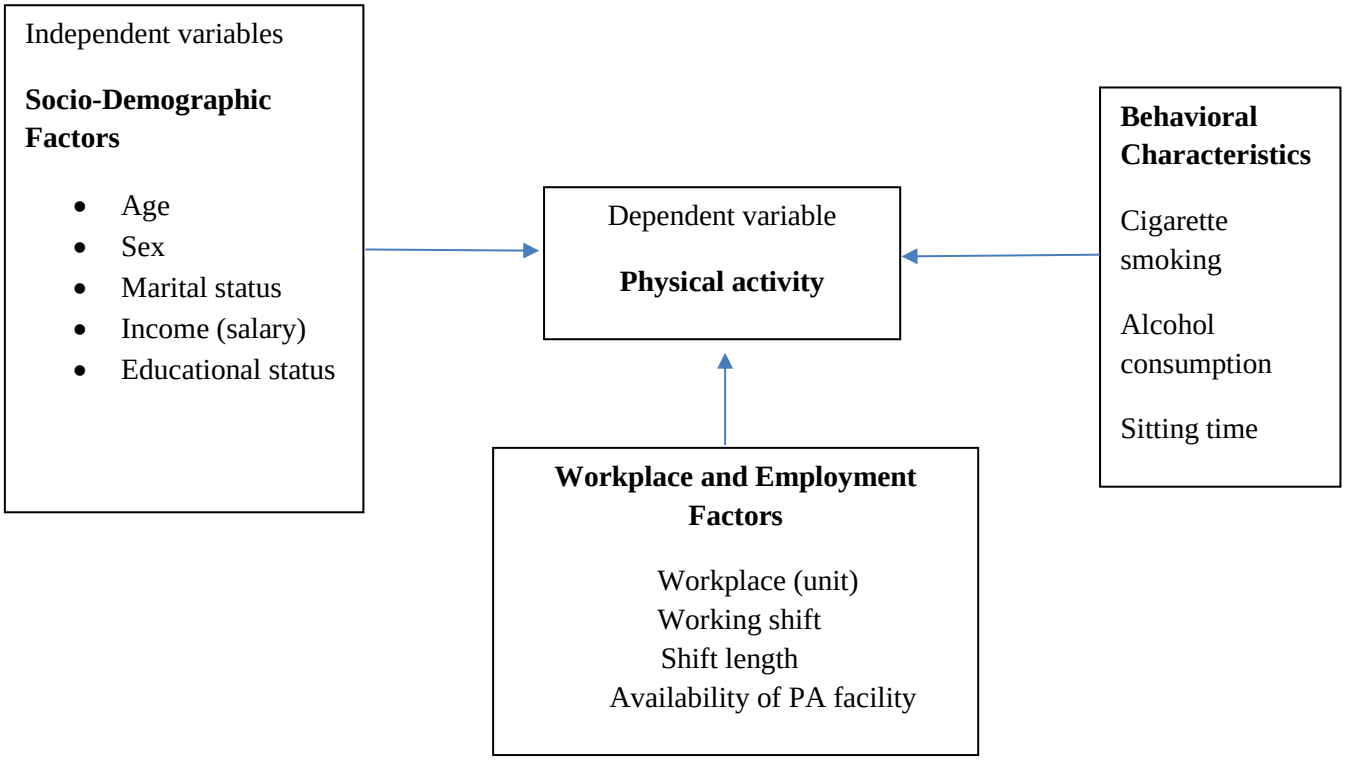


Figure 1- Conceptual framework on physical activity status and factors affecting physical activity among nurses working at selected public hospitals, Addis Ababa, Ethiopia, 2024. (n=316)

# 3. OBJECTIVES

## 3.1 General Objective

To determine the status and factors affecting physical activity among nurses working at selected public hospitals in Addis Ababa, Ethiopia 2024

## 3.2 Specific Objectives

- To assess the current level of physical activity among nurses working in selected public hospitals in Addis Ababa, Ethiopia.

- To identify the factors that influence physical activity levels among nurses in the selected public hospitals.

# 4. METHODS

## 4.1 Study Area

The study was conducted at selected public hospitals in Addis Ababa, Ethiopia's capital city. The African Union and the UN World Economic Commission for Africa are also based in Addis Ababa. Situated between 2320 and 3000 meters above sea level, the city spans 527 square kilometers and experiences an average annual temperature of 10 to 32 degrees Celsius along with an approximate 1200mm of rainfall. Addis Ababa has eleven sub-cities. Based on World Health Organization population prediction values, the estimated population of the city in 2021 was 5.46 million (36). In Addis Ababa, there are 13 governmental public hospitals, one university hospital, six federal hospitals, and six regional hospitals. 4 hospitals are chosen by using a simple random sampling (lottery) method. The study was conducted in Tikur Anbessa Specialized Hospital, Yekatit Hospital, Alert Hospital, and St. Paul's Hospital Millennium Medical College.

Tikur Anbessa Specialized Hospital (TASH) is one of the biggest referral hospitals in Ethiopia's capital, have 850 beds, 50 subspecialists, 221 specialists, 203 general practitioners (GP) doctors, and 854 nursing staff members (TASH, 2019). To support the hospital's operations, 950 administrative employees are employed on a contract and permanent basis. The hospital serves a wide range of patients who travel from all around the nation. It has been a university teaching hospital since 1998, providing preclinical and clinical training for the majority of professions (34).

Alert Hospital was originally designed to treat leprosy-related illnesses. Afterward, it has evolved into a facility that offers general medical care to patients of all stripes. It also offers training services and carries out health-related research. The hospital has 2007 human resources and a total of 1871 health professionals and administrative staff. It has 502 beds with 163 specialists, 140 GPs, and 531 nurses (35).

Yekatit 12 Hospital, One of the six hospitals in the metropolitan area, Yekatit 12 Hospital Medical College is a pioneer in several fields, including dentistry, obstetrics, and burn care. The hospital employs 520 nurses, 59 pharmacy professionals, 180 general practitioners, residents, and public health specialists in addition to 130 specialists and subspecialists (36).

St. Paul's Hospital Millennium Medical College (SPHMMC), in 2010, a decree issued by the Council of Ministers gave the medical school its current name. More than 5100 clinical, academic, administrative, and support staff members work at the institution teaching future doctors and nurses, conducting basic and applied research, and treating patients referred from throughout the nation. Of its 1707 clinical employees, 1210 are nurses, 673 are faculty, 973 are administrative, and 1129 are contract workers. Although the college has more than 700 inpatient beds available (37).

### 4.2 Study Design and Period

A cross-sectional study was conducted from Feb 19– Mar 19/2024 G.C.

### 4.3. Population

#### 4.3.1. Source population

All nurses working at hospitals in Addis Ababa

#### 4.3.2 Study population

All conveniently selected nurses in selected public hospitals, Addis Ababa who were available during the data collection period.

### 4.4 Inclusion and exclusion criteria

#### 4.4.1 Inclusion criteria

All conveniently selected nurses who are permanent and available during the data collection period in the selected public hospitals, with 6 months and above work experience

#### 4.4.2 Exclusion criteria

Pregnant nurses, nurses who are on sick leave, annual and maternity leave.

### 4.5 Sample size determination

The sample size was determined by using the single population proportion formula. There is no related study of physical activity status and factors affecting it among nurses in Ethiopia, so

using a prevalence of 50%,95% of confidence interval level (Zα/2=1.96), and a margin of error to be 5 %(d=0.05). The sample size was calculated as follows

N= (Zα/2)2×P (1-P)/d2

N=384

The sample size correction algorithm was applied and a 10% non-response rate was added because the source population (3115) was less than 10,000 (N<10,000),

Then the final sample size was determined to be 353. However, 316 (90%) were collected due to time constrain and also most of the participants were not cooperative at the time of data collection.

### 4.6 Sampling technique

The city of Addis Ababa is home to 13 public hospitals in total and from these four hospitals are selected by using a simple random sampling (lottery) method and the calculated sample size is distributed to each hospital proportionally depending on the number of nurses in each hospital, then from each hospital by using convenience sampling nurses be selected from the sample size proportionally distributed to each hospital. The total number of nurses working in TASH, SPHMMC, Alert Hospital, and Yekatit 12 Hospital is 3115. (Figure 2)

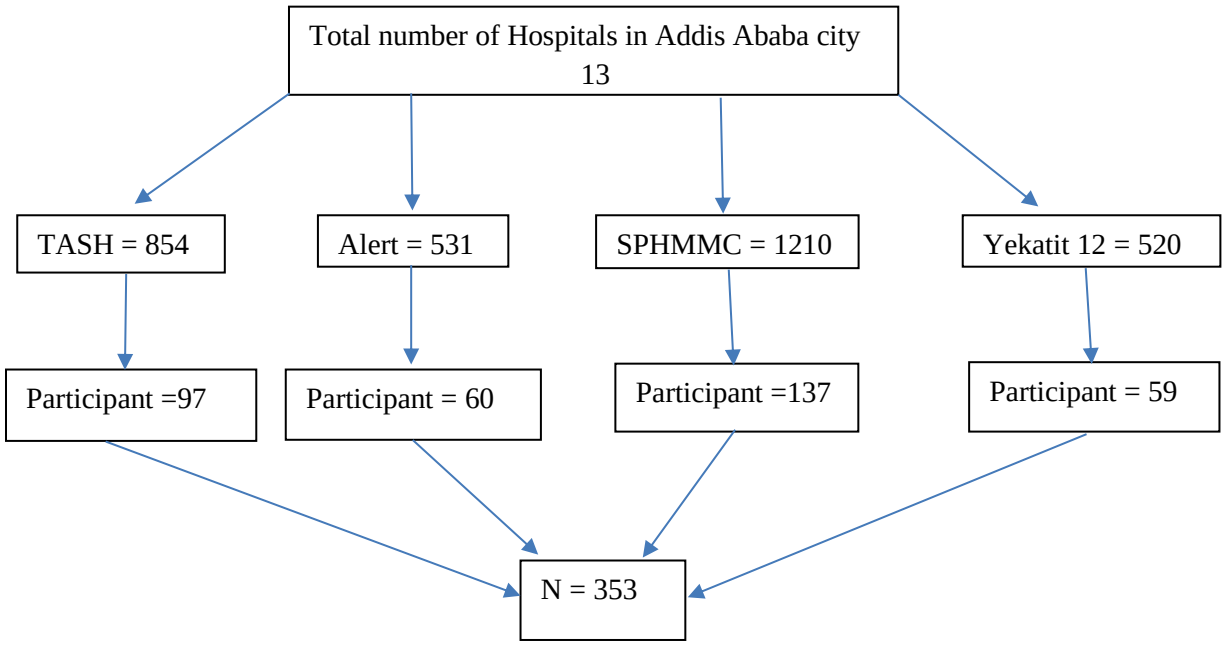

Figure 2: Sampling procedure and technique that be used to identify the status of and factors affecting physical activity among nurses working at selected hospitals, in Addis Ababa Ethiopia, 2024 (n=316).

### 4.7 Study variables

#### 4.7.1 Dependent variables

Physical activity

#### 4.7.2 Independent variables

**Socio-demographic characteristics**- age, sex, marital status, income, educational status,

**Behavioral characteristics**- cigarette smoking, alcohol consumption, sitting time

**Workplace and employment factors**- workplace unit, work shift, shift length, availability of PA facility

### 4.8 Operational definitions

**Physical active**– nurses who engage in at least 75 minutes of vigorous-intensity PA or 150 minutes of moderate-intensity PA each week or an equal combination of exercise that ranges from moderate to vigorous throughout the week (7).

**Physical inactive –** nurses who engage in less than 75 minutes of vigorous-intensity PA or less than 150 minutes of moderate-intensity PA per week or less than an equal combination of exercise that ranges from moderate to vigorous throughout the week (7).

**Moderate-intensity physical activity –**activities that require moderate physical effort and cause small increases in breathing or heart rate (brisk walking or carrying light loads for at least 10 minutes continuously) (7).

**Vigorous-intensity physical activity –** activities that significantly increase heart rate or respiration and demand a lot of physical effort (carrying or lifting heavy loads, jogging for at least 10 minutes continuously) (7).

### 4.9 Questionnaire and data collection tool

Essentially, the Global Physical Activity Questionnaire (GPHQ) is a tool for gathering data (38). It is employed for evaluating the level of physical activity. It was a semi-structured self-administered questionnaire consisting of 33 questions under socio-demographic, behavioral characteristics, and physical activity. The data were gathered by four nursing students and one senior supervisor who has a BSc in nursing and experience with data collection. For one day, supervisors and data collectors receive training on the study's applicability the importance of obtaining informed consent, client confidentiality, eligibility requirements, and how to collect data.

### 4.10 Data Quality Assurance

The data quality was ensured via appropriate design and pretesting on 5% of the sample of participants of the questionnaires at Balcha Hospital alone a week before the actual data collection to evaluate the clarity of questions. By using the Cronbach Alpha test and five expert researchers' the validity and reliability of the instrument were maintained. Training was given to the data collection team before the data collection period. The supervisors review the consistency and completeness of the questionnaires completed by the data collectors to ensure the quality of the data.

### 4.11 Data processing and analyzing

The data were cleaned for missing and inconsistent values coded and then entered into SPSS (Statistical Product and Service Solutions) version 27 for analysis. Text, tables, figures, and summary metrics like mean, standard deviation, and proportion were used to display the data. Descriptive statistics like frequency distributions, percentages, mean, and standard deviations to summarize findings. Bivariate and multivariable binary logistic regression models were used to identify factors associated with physical activity. During bivariate analysis, variables with a p-value $< 0.2$ were imported to multivariable logistic regression analysis, and then for multivariable analysis p-value $< 0.05$ was used to declare as statistically significant factors. Odds ratio (OR) and 95% confidence interval (CI) were used to measure the strength of association between dependent and independent variables

### 4.12 Ethical consideration

The Institutional Review Board (IRB) at Addis Ababa University's College of Health Sciences granted ethical permission for the study (protocol number SNM/03/2024). We got verbal consent from every study participant. The Helsinki Declaration was followed when conducting the study. Study participants could only be identified by their code numbers and stored in a separate, safe area. Participants in the study were given information about the purpose, the subject matter, and their opportunity to refuse or stop having their data collected, all while maintaining their confidentiality and anonymity. Each research team member has undergone confidentiality training and is aware that discussing study participants with individuals outside of the research context is inappropriate.

### 4.13 Result dissemination plan

The findings of the research were disseminated to Addis Ababa University College of Health Science, School of Nursing and Midwifery. Additionally, the findings were shared or submitted to TASH, Alert Hospital, Menelik II Hospital, St. Paul's Hospital Millennium Medical College, and seminars, workshops, conferences, and meetings held locally or internationally. Lastly, an attempt was made to publish in reputable peer-reviewed national and international journals.

# 5. RESULTS

## 5.1 Socio-Demographic Characteristics

A total of 353 questionnaires were distributed among the study participants, and from these 316 respondents were replied with a response rate of 90%. Out of the total, a larger portion of the group comprises females, with 206 participants making up 65.2% of the population. The mean age of the study participants was 29.14. The data presented seems to outline the distribution of a certain population or sample across various age categories, providing both the number of individuals in each category and their respective percentages of the total group.

In the youngest age group, those aged 20 to 25; we see a total of 47 individuals, which represents 14.9% of the overall population being considered. This suggests a modest representation of younger adults in the sample. Moving up the age category 26 to 30 age group with 171 individuals accounting for over half of the population at 54.1%. The 31 to 35 age group sees a slight decrease in numbers, with 50 individuals making up 15.8% of the total. The 36 to 40 age group shows a more substantial drop in representation, with only 12 individuals or 3.8% of the population. For those aged 41 and above, the data includes 36 individuals, accounting for 11.4% of the total population.

The data presented categorizes 316 individuals by their marital status and provides a percentage representation of each category. Among the participants shows a majority of them, 185 (58.5%), are single. This is followed by those who are married, accounting for 121 participants 38.3% of the sample. A small fraction is either widowed, at 4 individuals 1.3%, or divorced, comprising 6 participants 1.9%.

The demographic data was collected from a study involving 316 nurses. The educational qualifications of the participants showcase a significant leaning towards higher education, with a vast majority holding a Degree 267 (84.5%). This is followed by a substantial segment with Masters Qualifications 47 (14.9%), underscoring a commitment to advanced education and specialization in the nursing field. Interestingly, a very small fraction 2 (0.6%) of the participants reported having a diploma, highlighting a trend towards obtaining higher academic credentials in the nursing profession.

The largest group, comprising 61.4% of the participants, earns a monthly income ranging between 4,500 to 7,500 Birr. This segment, accounting for 194 nurses, reflects the common salary bracket for many within the profession, suggesting that a majority of nurses fall within this income range. Following this, the next substantial group consists of 32.3% of the participants, with 102 nurses earning a monthly salary between 7,501 to 10,500 Birr. Only 18 nurses, 5.7% of the participants, earn between 10,501 to 13,500 Birr monthly. Even more scarce are those in the 13,501 to 16,500 Birr salary range, with merely 2 nurses making up 0.6% of the total participants.

The distribution of nurses across different departments within the healthcare facility reveals a diverse representation of specialties. The largest group of nurses, constituting 167 (52.8%), work in the inpatient department (IPD). The intensive care unit (ICU) and outpatient department (OPD) are almost equally represented, with 581(8.4%) and 59(18.7%) of the nurses working in these areas, respectively. The emergency room department (ER), while essential, accounts for a smaller portion of the workforce 32 (10.1%).

In terms of work patterns, the participants' working hours have a diverse range of schedules. A total of 80 nurses, representing 25.3% of the sample, work standard 8-hour day shifts. This contrasts with 54 nurses, or 17.1% of the participants, who are on night shifts extending to 16 hours, underscoring the demanding nature of nursing that requires around-the-clock coverage. The most common working arrangement among the nurses is a mixed shift, where they alternate between day and night duties. This group is the largest, with 182 nurses, or 57.6% of the participants. (Table 1)

Table 1. Socio-demographic characteristics of nurses on physical activity status and factors affecting it in Addis Ababa selected government hospital, Ethiopia, 2024 (n = 316)

| Variables | | Frequency | Percent |
|---|---|---|---|
| Sex | Male | 110 | 34.8 |
| | Female | 206 | 65.2 |
| | | | |
| Age | 20-25 | 47 | 14.9 |
| | 26-30 | 171 | 54.1 |
| | 31-35 | 50 | 15.8 |
| | 36-40 | 12 | 3.8 |
| | >=41 | 36 | 11.4 |
| | | | |
| Marital status | Single | 185 | 58.5 |
| | Married | 121 | 38.3 |
| | Widowed | 4 | 1.3 |
| | Divorced | 6 | 1.9 |
| | | | |
| Educational Background | Diploma | 2 | 0.6 |
| | Degree | 267 | 84.5 |
| | Masters | 47 | 14.9 |
| | | | |
| Monthly Income | 4500 -7500 birr | 194 | 61.4 |
| | 7501-10,500 birr | 102 | 32.3 |
| | 10,501-13,500 birr | 18 | 5.7 |
| | 13,501-16,500 birr | 2 | 0.6 |
| | | | |
| Department | Emergency | 32 | 10.1 |
| | ICU | 58 | 18.4 |
| | IPD | 167 | 52.8 |
| | OPD | 59 | 18.7 |
| | | | |
| Shift length | 8 hrs | 80 | 25.3 |
| | 16 hrs | 54 | 17.1 |
| | Mixed | 182 | 57.6 |

### 5.2 Level of Physical Activity

The data provided offers insight into the exercise habits of a group of 316 participants, specifically focusing on the time they spend engaging in moderate or vigorous physical activity intensity sports, fitness, or recreational activities daily.

For vigorous activity at work, 134 nurses (42.1%) reported engaging in such activities, while 182 nurses (57.6%) did not. When breaking down the time spent on these activities, a significant number, 210 (66.5%) nurses, spent less than 1 hour on vigorous activities daily, 33 (10.4%) spent between 1 to 2 hours, and 73 (23.1%) spent more than 2 hours. The mean score time spent on vigorous activities is 1.56 hours with a standard deviation of 0.842 hours. This suggests that while a majority of nurses engage in some form of vigorous activity, it tends to be for a relatively short duration.

For vigorous-intensity activity at work weekly, the data shows that individuals who engage in less than 75 minutes per week are mostly inactive in their overall physical activity, making up 59.5% of the total with 188 individuals categorized in this group. Conversely, those who engage in more than 75 minutes of vigorous activity at work weekly are generally more active overall, with 128 individuals (40.5%) falling into this category. Out of a total group (presumably 316 nurses, based on the percentages provided), 244 nurses, which constitute 77.2% of the sample, partake in less than 75 minutes of vigorous-intensity sports per week. This group is categorized as inactive. The remaining 72, physically active making up 22.8% of the sample, engage in more than 75 minutes of vigorous intensity sports weekly.

In terms of moderate activity at work, more nurses 204 (64.6%) reported engaging in these activities compared to those who did not 112 (35.4%). The distribution of time spent on moderate activities shows 135 (42.7%) nurses spending less than 1 hour, 30 (9.5%) spending between 1 to 2 hours, and a notably higher number, 151 (47.8%) nurses, spending more than 2 hours. The average mean time for moderate activities is 2.05 hours with a standard deviation of 0.951 hours, indicating a broader spread of time spent on moderate activities compared to vigorous ones, with a significant portion of nurses engaging in moderate activities for longer durations.

In the case of moderate-intensity activity weekly, the results are somewhat different. Here, individuals who engage in less than 150 minutes of moderate activity at work per week are less likely to be active overall, making up 39.5% of the total with 128 individuals. On the other hand, those who spend more than 150 minutes per week in moderate-intensity activities at work are more likely to be active overall, with 188 individuals which represent 60.5% of the sample.

Lastly, for walking or bicycling, the responses were nearly split with 161(50.9%) nurses participating in these activities and 155 (49.1%) not. A vast majority, 245 (77.5%) nurses, spent less than 1 hour walking or bicycling, 54 (17.1%) spent between 1 to 2 hours, and only 17 (5.4%) spent more than 2 hours on such exercises. The average mean time spent on walking or bicycling is 1.278 hours with a standard deviation of 0.556 hours, suggesting that while walking or bicycling is a popular form of exercise among nurses, it is generally practiced for a shorter duration.

This data highlights the commitment of nurses to maintaining physical activity despite their demanding work schedules. It also suggests a preference for moderate activities over vigorous ones, possibly due to the nature of their work or personal preferences for less intensive forms of exercise.

The data presented indicates the daily physical activities of nurses outside their hospital duties, focusing on the distinction between vigorous and moderate activities. For vigorous activities, we observe that a minority of the nurses, 86 (27.2%) out of 316, engage in such activities outside of work. The distribution of time spent on these activities reveals that a significant majority, 262 (82.9%) nurses, spend less than 1 hour on vigorous activities daily. A smaller subset, 31 (9.8%) nurses, dedicate 1 to 2 hours, while 23 (7.3%) nurses spend more than 2 hours. The average time spent on vigorous activities is 1.243 hours, with a standard deviation of 0.575. This indicates a relatively low level of engagement in vigorous physical activities among the nurses, with the majority spending minimal time on such activities. The standard deviation suggests a moderate variation in the time nurses dedicate to vigorous activities.

In contrast, moderate activities of nurses outside hospital tasks show a slightly different pattern. A marginally higher number of nurses, 88 (27.8%) out of 316, report engaging in moderate activities daily. The time distribution for moderate activities leans heavily towards less than 1

hour, with 271 (85.8%) nurses falling into this category. This is followed by 25 (7.9%) nurses who spend 1 to 2 hours and 20 (6.3%) nurses who engage in moderate activities for more than 2 hours. The average mean time spent on moderate activities is slightly less than that for vigorous activities, at 1.205 hours, with a standard deviation of 0.539. This suggests that while a similar proportion of nurses engage in moderate activities as those who do vigorous activities, the overall time spent on moderate activities is slightly less, albeit with a slightly lower variation among individuals.

This data interpretation indicates a trend where nurses, despite their demanding jobs, make time for physical activities outside of work, although for a limited duration. The preference for less intense, moderate activities over vigorous ones could reflect the exhausting nature of their profession or a lack of time. The relatively low standard deviations for both types of activities suggest that nurses' engagement in physical activities outside of work is somewhat consistent, although low in intensity and duration. This insight into nurses' off-duty physical activity can inform workplace wellness programs, suggesting a potential need for initiatives that encourage and facilitate higher engagement in physical activities, tailored to the demanding schedules of nursing professionals. (Table 2)

Table 2. Level of physical activity of nurses on physical activity status and factors affecting it in Addis Ababa selected government hospital, Ethiopia, 2024 (n = 316)

| Nurses' physical activity | | Freq | Percent | Mean | S.D |
|---|---|---|---|---|---|
| Vigorous intensity activity at work daily | Yes | 134 | 42.1 | 1.56 | 0.842 |
| | No | 182 | 57.6 | | |
| | < 1 hr | 210 | 66.5 | | |
| | 1 hr to 2 hrs | 33 | 10.4 | | |
| | >2 hrs | 73 | 23.1 | | |
| Vigorous intensity activity at work weekly | <75 minutes | 188 | 59.5 | | |
| | >75 minutes | 128 | 40.5 | | |
| Moderate intensity activity at work daily | Yes | 204 | 64.6 | 2.05 | 0.951 |
| | No | 112 | 35.4 | | |
| | < 1 hr | 135 | 42.7 | | |
| | 1 hrs to 2 hrs | 30 | 9.5 | | |
| | >2 hrs | 151 | 47.8 | | |
| Moderate intensity activity at work weekly | <150 minutes | 128 | 39.5 | | |
| | > 150 minutes | 188 | 60.5 | | |
| Use a walk or bicycle daily | Yes | 161 | 50.9 | | |
| | No | 155 | 49.1 | | |

| | | | | | |
|---|---|---|---|---|---|
| | < 1 hr | 245 | 77.5 | 1.278 | 0.556 |
| | 1 hr to 2 hr | 54 | 17.1 | | |
| | >2 hrs | 17 | 5.4 | | |
| Any vigorous-intensity sports or recreational activities daily | Yes | 86 | 27.2 | | |
| | No | 230 | 72.8 | | |
| | < 1 hr | 262 | 82.9 | | |
| | 1 hr to 2 hr | 31 | 9.8 | 1.243 | 0.575 |
| | >2 hrs | 23 | 7.3 | | |
| Any vigorous-intensity sports or recreational activities weekly | <75 minutes | 244 | 77.2 | | |
| | > 75 minutes | 72 | 22.8 | | |
| Any moderate-intensity sports or recreational activities daily | Yes | 88 | 27.8 | | |
| | No | 228 | 72.2 | | |
| | < 1 hr | 271 | 85.8 | 1.205 | 0.539 |
| | 1 hr to 2 hrs | 25 | 7.9 | | |
| | >2 hrs | 20 | 6.3 | | |
| Any moderate-intensity sports or recreational activities weekly | <150 minutes | 266 | 84.2 | | |
| | >150 minutes | 50 | 15.8 | | |

## 5.3 Alcohol and Smoking Behavior

In a study involving 316 participants engaging in physical exercises, the breakdown of smoking and alcohol consumption habits among the participants presents insightful data into their lifestyle choices. Out of the total participants, a small fraction, specifically 12 individuals which accounts for 3.8%, were identified as smokers. This contrasts significantly with the non-smoking majority, comprising 304 participants or 96.2% of the total, highlighting a predominant tendency towards non-smoking habits within this group.

Furthermore, the study also delved into alcohol consumption patterns among the participants. It was found that 54 individuals, representing 17.1% of the participants, consumed alcohol. On the other hand, a larger portion of the group, amounting to 262 participants or 82.9%, did not partake in alcohol drinking. (Figure 3)

This data provides a clear picture of the lifestyle choices related to smoking and alcohol consumption among individuals engaged in physical activity. The significant majority of non-smokers and non-alcohol consumers could indicate a conscious decision towards healthier living habits, potentially influenced by their involvement in regular physical exercise. (Figure 4)

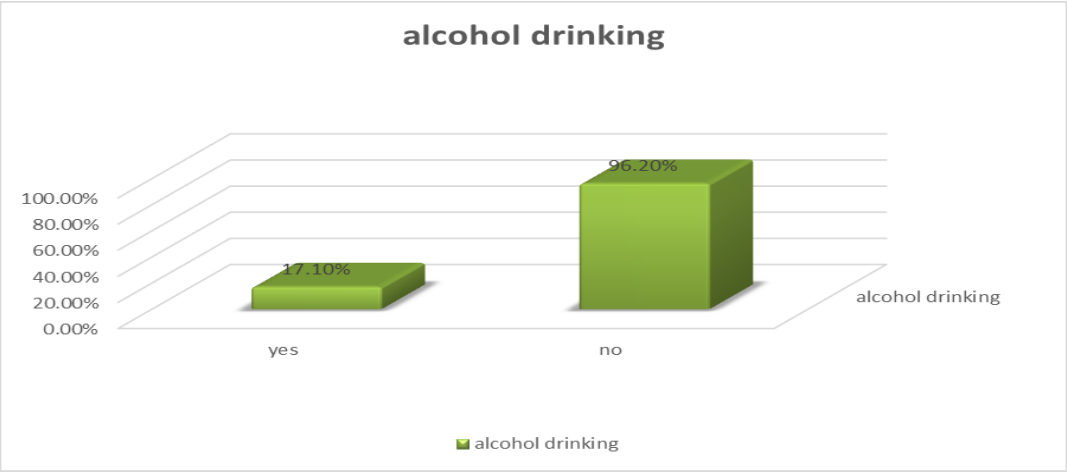


Figure 3. Alcohol drinking behavior of nurses on physical activity status and factors affecting it in Addis Ababa selected government hospital, Ethiopia, 2024 (n = 316)

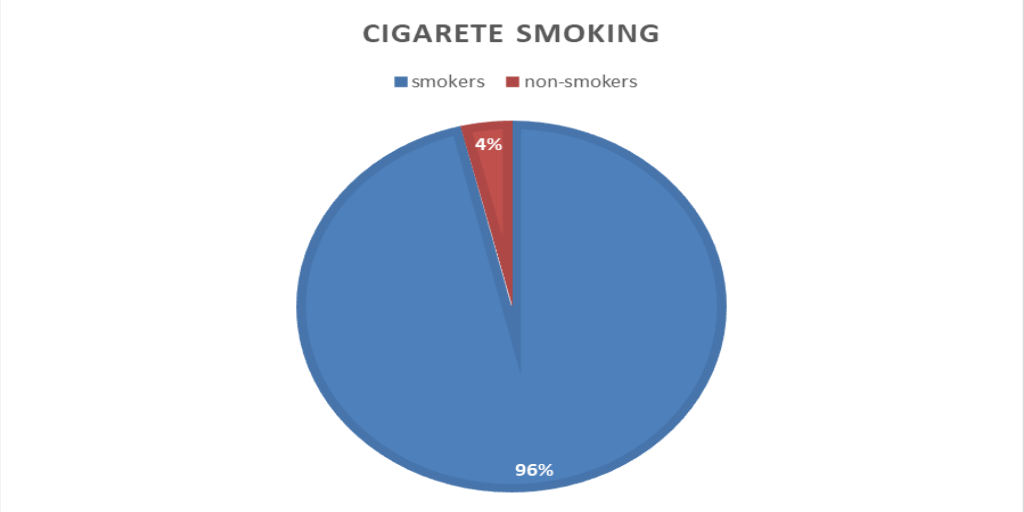


Figure 4. Smoking behavior of nurses on physical activity status and factors affecting it in Addis Ababa selected government hospital, Ethiopia, 2024 (n = 316)

## 5.4 Physical Activities and Factors Affecting

The physical activity levels among sex group categories within this specific demographic, it is noted that out of 60 individuals, 24 males (40%) and 36 females (60%) are categorized as inactive. This means they engage in less than 150 minutes of moderate-intensity physical activity per week, or less than 75 minutes of vigorous-intensity physical activity per week, or less than an equivalent mixture of both.

On the flip side, a more encouraging figure emerges among those who are physically active. In this case, 86 males (33.6%) and 170 females (66.4%) meet or exceed the recommended level of physical activity. This demonstrates a greater inclination towards exercise among females in the observed group, contrasting sharply with the higher inactivity rates seen in males.

The finding shows single individuals represent 60.5% of those engaging in physical exercise activity, with married participants following closely at 37.5%. This indicates a high level of engagement in physical activities among people who are not married, perhaps suggesting that single individuals might have more time or motivation to dedicate to their physical well-being. On the other hand, the widowed and divorced groups show significantly lower participation rates in physical activities, at 0.8% and 1.2%, respectively, perhaps reflecting the impact of life changes on health and fitness routines.

When examining those who are inactive, working less than the recommended level of physical activity. 50.0% of single individuals fall into this category, suggesting that while a portion of the single population is highly active, a larger portion is not meeting the recommended levels of physical activity. Married individuals account for 41.7% of the inactive group, which, while lower than the single group, still represents a significant portion of the population not engaging in sufficient physical activity. The percentages of widowed and divorced individuals in the inactive category are notably low, at 3.3% and 5.0% respectively, which could be due to the smaller overall numbers of people in these categories.

These statistics underscore the importance of understanding the role marital status plays in physical activity levels. (Table 3)

The distribution of physical exercise activity across various age groups provides insightful data on how engagement in physical activities changes with age. The data categorizes individuals based on their weekly participation in physical exercise, distinguishing between those who are inactive (working out for less than the recommended level of physical activity) and those who are physically active (exercising for more than the recommended level of physical activity).

For individuals aged 20-25, we observe that 10.0% are inactive, while a significantly higher percentage, 16.0%, are active, indicating a greater inclination towards physical activity within

this age group. This could be attributed to higher energy levels, more free time, or a stronger social motivation to engage in physical activities among younger adults.

The 26-30 age groups show a marked increase in physical activity, with 53.3% being inactive and a remarkable 54.3% being active. This suggests an age range where individuals are most motivated or able to incorporate regular exercise into their routine, possibly due to lifestyle stability or peak awareness of health benefits.

However, as we look at the 31-35 and 36-40 age groups, there's a noticeable decline in physical activity. Only 18.3% and 6.7% are inactive, respectively, while 15.2% and 3.8% are active. This decline could be linked to increased responsibilities such as career demands and family, which may limit the time available for exercise.

Interestingly, the data shows a slight uptick in physical activity for those above 41, with 11.7% being inactive and 11.3% active. In conclusion, engagement in physical exercise varies significantly across age groups peaking in the late twenties and gradually declining, with a minor revival in later years. (Table 3)

The physical activity levels among hospital staff across different departments reveal insightful trends, particularly when comparing those who engage in less than 150 minutes of exercise per week, or less than 75 minutes of vigorous-intensity exercises per week, or less than an equivalent mixture of both with those exceeding this benchmark.

In departments such as the Intensive Care Unit (ICU) and the Emergency Room (ER), the percentage of staff engaging in less than the recommended level of physical activity stands at 11.7% and 6.7%, respectively. Conversely, when looking at those committing to more than 150 minutes of exercise weekly, the numbers jump significantly to 19.9% in the ICU and 10.9% in the ER.

The Inpatient and Outpatient Departments present a different scenario. A majority of 56.7% in the Inpatient Department and 25.0% in the Outpatient Department fall into the less active category, engaging in less than 150 minutes of exercise. Yet, when considering higher levels of activity, 52.0% of Inpatient and 17.2% of Outpatient Department nurses exceed the

recommended level of physical activity. This discrepancy highlights a significant divide in physical activity levels among hospital staff. (Table 3)

According to the survey, nurses with degree holders are the most active group, with 84.8% of them engaging in more than the benchmark of physical activity per week. This statistic is closely followed by those with a master's degree or higher, who account for 14.5% within the same category. On the other end of the spectrum, when it comes to performing physical activity for less than the recommended level of physical activity, 83.3% of the nurses with a degree and 16.7% with a master's or higher reported not achieving this benchmark. Interestingly, those with only a diploma did not significantly contribute to the statistics, highlighting a potential gap in health and wellness practices among different educational levels within the hospital staff.

These findings underscore the importance of promoting physical activity among hospital staff nurses, regardless of their educational background. The correlation between higher education and increased physical activity could be attributed to a variety of factors, including awareness of health benefits and access to resources and facilities. However, it also points to the need for targeted interventions to encourage those at all levels of educational attainment to incorporate more exercise into their busy schedules. This could not only improve their health and well-being but ultimately enhance their ability to provide high-quality care to their patients. (Table 3)

This survey categorizes nurses based on their alcohol consumption habits and correlates these habits with the amount of time they dedicate to physical exercise within a week.

Among the participants, 16 nurses, accounting for 26.7% of those who consume alcohol, engage in physical activity for less than the recommended level of physical activity. This statistic is contrasted with the 44 non-drinking participants, who represent 73.3% of the total, and also engage in less than the recommended level of physical activity. This initial comparison suggests a higher inclination towards limited physical activity among non-drinkers within this specific professional demographic.

On the flip side, when examining those who exceed the recommended level of physical activity, a distinct pattern emerges. Out of the total, 218 nurses, or 85.2%, do not consume alcohol and engage in more than the recommended level of physical activity. In contrast, 38 nurses, accounting for 14.8% of the alcohol-consuming group, managed to surpass the 150-minute

exercise threshold. This data indicates a significantly higher proportion of non-drinkers among hospital staff nurses engaging in what is considered a healthier level of physical activity. (Table 3)

From the data provided, it's evident that there is a significant difference in the physical activity levels between smokers and nonsmokers. Among the participants, only 6.7% of cigarette smokers fall into the category of being physically inactive, meaning they engage in less than the recommended level of physical activity. In contrast, 93.3% of nonsmokers are also categorized as physically inactive. This suggests that while smoking status may influence physical activity, the majority of participants, regardless of smoking status, do not meet recommended activity levels.

On the other hand, when considering those who are physically active defined as performing more than the recommended level of physical activity the numbers tell a different story. Only 3.1% of cigarette smokers are considered physically active, compared to 96.9% of nonsmokers. This disparity highlights a significant trend. Nonsmokers are overwhelmingly more likely to engage in a healthier lifestyle that includes sufficient physical activity.

These statistics shed light on the broader implications of smoking on health and lifestyle choices. Smoking may not only lead to direct health issues but also correlate with lower levels of physical activity, which in itself is a risk factor for numerous health conditions. (Table 3)

The Analysis of this data gives trends in how the length and timing of shifts might impact physical activity levels, specifically categorized by engaging in less than or more than 150 minutes of exercise per week.

Of nurses working 8-hour day shifts, (30%) 18 are physically inactive, engaging in less than 150 minutes of exercise per week, while a substantial majority, (24.2%) 62, are physically active, exceeding the recommended level pf physical activity benchmark. This suggests that day shift workers have a relatively higher propensity to engage in physical activity, possibly due to more regular schedules that might align better with daytime exercise opportunities.

The scenario is somewhat similar for nurses working 16-hour shifts, with (18.3%) 11 falling into the physically inactive category and (16.8%) 43 being physically active. Interestingly, the

percentage of physically active nurses is slightly higher among 16-hour shift workers compared to day shift workers. This could indicate that 16-hour shift workers, despite the unconventional hours, might prioritize or find unique ways to incorporate exercise into their routines, possibly to counteract the strain of long hours and night work.

Mixed shift workers, who alternate between day and night shifts, show the highest percentage of physical activity, with 59% (151) being physically active, compared to 51.7% (31) who are physically inactive. The higher physical activity levels among mixed shift workers could stem from a more varied schedule that potentially offers more flexibility or motivation to engage in exercise, despite the challenges of adapting to shifting work hours.

In summary, the data suggests a positive correlation between being physically active and working different shift lengths and times among hospital staff nurses. Notably, mixed shift workers have the highest rate of physical activity, followed by, day shift workers and then 16-hour shift workers. This could imply that the variability in work schedules, rather than hindering physical activity, might facilitate higher levels of exercise engagement among hospital staff nurses. (Table 3)

In the hospital, where a physical activity facility such as a gym is available, 49 staff members 19.5% are physically active, this suggests that while access to a gym might encourage physical activity for some, it does not guarantee that all staff will take advantage of the facility. In an institution where no physical activity facility is available, a much larger sample of 207 staff members 80.5% are physically active. This data indicates that the lack of a formal facility does not necessarily hinder physical activity among the majority of staff. It might imply that these staff members find alternative ways to stay active, such as outdoor exercises, home workouts, or other forms of physical activity that do not require a gym. In a hospital where a gym is available Out of the staff only 6 individuals, representing 10%, were physically inactive, and in an institution where no physical activity facility is available 54 staff which is 90 % physically inactive

Overall, these findings suggest that while the availability of physical activity facilities can be beneficial, it is not the sole determinant of physical activity levels among staff. Other factors,

such as personal motivation, lifestyle choices, and alternative means play roles in influencing physical activity. (Table 3)

The data provided offers an interesting glimpse into the relationship between monthly income brackets and physical activity levels among a group of nurses. The income is denominated in birr, which suggests the context may be in Ethiopia or a region using a similar currency system.

In the lowest income ranging from 4,500 to 7,500 birr, a significant majority of 156 individuals (60.9%) reported being physically active, while 38 individuals (63.3%) were physically inactive. This suggests a high level of physical activity among individuals in this income group.

For those earning between 7,501 and 10,500 birr, the percentage of physically active individuals slightly increases to 32.8%, with 84 individuals active and 18 which is 30% inactive. This increment, though slight, might indicate a trend where increased income correlates with slightly higher physical activity the change is marginal.

The trend continues modestly in the 10,501-to-13,500-birr income bracket where 15 individuals 5.9% are physically active, compared to 3 individuals 5% who are inactive. Again, this suggests a slight increase in physical activity with higher income.

Interestingly, in the highest income bracket surveyed, from 13,501 to 16,500 birr, the sample size is notably smaller with only 1 individual physically active and 1 individual physically inactive. (Table 3)

Table 3. Associated factors of physical activity among nurses in Addis Ababa selected government hospital, Ethiopia, 2024 (n = 316)

| Variables | | Physical Activity | | Total |
|---|---|---|---|---|
| | | Inactive | Active | |
| Sex | Male | 24(40.0%) | 86(33.6%) | 110(34.8%) |
| | Female | 36(60.0%) | 170(66.4%) | 206(65.2%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Marital status | Single | 30(50.0%) | 155(60.5%) | 185(58.5%) |
| | Married/cohabiting | 25(41.7%) | 96(37.5%) | 121(38.3%) |
| | Widowed | 2(3.3%) | 2(0.8%) | 4(1.3%) |
| | Divorced/separated | 3(5.0%) | 3(1.2%) | 6(1.9%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Age group | 20-25 | 6(10.0%) | 41(16.0%) | 47(14.9%) |

| | | | | |
|---|---|---|---|---|
| | 26-30 | 32(53.3%) | 139(54.3%) | 171(54.1%) |
| | 31-35 | 11(18.3%) | 39(15.2%) | 50(15.8%) |
| | 36-40 | 4(6.7%) | 8(3.1%) | 12(3.8% |
| | >=41 | 7(11.7%) | 29(11.3%) | 36(11.4%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Workplace group | ICU | 7(11.7%) | 51(19.9%) | 58(18.4%) |
| | Emergency | 4(6.7%) | 28(10.9%) | 32(10.1%) |
| | IPD | 34(56.7%) | 133(52.0%) | 167(52.8%) |
| | OPD | 15(25.0%) | 44(17.2%) | 59(18.7%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Alcohol drinking | Yes | 16(26.7%) | 38(14.8%) | 54(17.1%) |
| | No | 44(73.3%) | 218(85.2%) | 262(82.9%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Cigarette smoking | Yes | 4(6.7%) | 8(3.1%) | 12(3.8%) |
| | No | 56(93.3%) | 248(96.9%) | 304(96.2%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Shift length | 8 hrs | 62(24.2%) | 18(30%) | 80(25.3%) |
| | 16hrs | 43(16.8%) | 11(18.3%) | 54(17.1%) |
| | Mixed | 151(59%) | 31(51.7%) | 182(57.6%) |
| Total | | 256(100%) | 60(100%) | 316(100%) |
| Physical Activity Facility in The Institution | Yes | 6(10%) | 49(19.5%) | 55(17.4%) |
| | No | 54(90%) | 207(80.5%) | 260(82.6%) |
| Total | | 60(100%) | 257(100%) | 316(100%) |
| Monthly Income/Salary | 4500-7500 | 38(63.3%) | 156(60.9%) | 194(61.4%) |
| | 7501-10,500 | 18(30%) | 84(32.8%) | 10232.3%) |
| | 10,501-13,500 | 3(5%) | 15(5.9%) | 18(5.7%) |
| | 13,501-16,500 | 1(1.7%) | 1(0.4%) | 2(0.6%) |
| Total | | 60(100%) | 256(100%) | 316(100%) |
| Educational level | Diploma | 0(0%) | 2(0.7%) | 2(0.6%) |
| | Degree | 50(83.3%) | 217(84.8%) | 267(84.5%) |
| | Masters and above | 10(16.7%) | 37(14.6%) | 47(14.9%) |

### 5.5 Regression Analyses of Physical Activity

The association between independent and dependent variables was assessed by using both binary logistic regression and multivariate logistic regression. Firstly, binary logistic regression analysis was conducted to see the crude association of each independent variable with the dependent variable, at the p-value of < 0.02. Accordingly, those variables whose p-value <0.02 (Marital status, working department, Alcohol drinking, physical activity fitness area in the

facility, and Sitting time) were assumed to be candidates for multivariate logistic regression analysis. During multivariate logistic regression, those variables whose p-value <0.05 were considered statistically significant and predictors of the level of physical activity. (Table 4)

Table 4. Bivariate regression of physical activity among nurses on physical activity status and factors affecting it in Addis Ababa, hospital, Ethiopia, 2024 (N= 316)

| **Variables** | | **COR** | **P-Value** | **80% C.I for EXP(B)** |
|---|---|---|---|---|
| **Sex** | Male | .349 | 1.318 | [.903 1.923] |
| | Female | 1.00 | 1.00 | |
| **Age** | 20-25 | .410 | .606 | [.279 1.320] |
| | 26-30 | .919 | .954 | [.526 1.730] |
| | 31-35 | .774 | 1.168 | [.583 2.341] |
| | 36-40 | .327 | 2.071 | [.799 5.369] |
| | >=41 | 1.00 | 1.00 | |
| **Marital status** | Single | **.051** | .194 | *** [.066 .568]** |
| | Married | .112 | .260 | **[.088]** |
| | Widowed | 1.000 | 1.000 | **[.191 5.230]** |
| | Divorced | 1.00 | 1.00 | |
| **Educational Background** | Diploma | .999 | .000 | [.000] |
| | Degree | .682 | .853 | [.518 1.404] |
| | Masters | 1.00 | 1.00 | |
| **Department** | Emergency | **.070** | .403 | *** [.212 .766]** |
| | ICU | .156 | .419 | **[.191 .919]** |
| | IPD | .418 | .750 | **[.476 1.183]** |
| | OPD | 1.00 | 1.00 | |
| **Shift length** | 8 hrs | .297 | 1.414 | [.923 2.166] |
| | 16 hrs | .574 | 1.246 | [.755 2.057] |
| | Mixed | 1.00 | 1.00 | |
| **Educational level** | Diploma | .999 | .000 | [.000] |
| | Degree | .682 | .853 | [.518 1.404] |
| | Master | 1.00 | 1.00 | |
| **Cigarette smoking** | Yes | .207 | 2.214 | [.988 4.964] |
| **Alcohol drinking** | Yes | .031 | 2.086 | *** [1.38 3.29]** |
| | No | 1.00 | 1.00 | |
| **PA in facility** | Yes | **.097** | .467 | *** [.259 .841]** |
| | No | 1.00 | 1.00 | |
| **Sitting time** | Yes | **0.11** | .0375 | *** [0.25 0.545]** |
| | No | 1.00 | 1.00 | |

After controlling the confounder variables Marital status, working department, Alcohol drinking, physical activity in the facility, and Sitting time were found to have a significant association with the level of physical activity. The study also showed that respondents whose behavior not drinking alcohol were **2.416** times more likely to engage in physical activity compared with alcohol drinking behavior **[AOR=2.416; 95% CI=1.148 - 5.086]**. The study showed that respondents who spent time by sitting less than 4 hours were **0.404** times less likely to engage in physical activity compared to those who spent time by sitting more than 4 hours **[AOR=0.404; 95% CI= 0.221 - 0.740]**. (Table 5)

Table 5. Multivariate regression of physical activity among nurses on physical activity status and factors affecting it in Addis Ababa, hospital, Ethiopia, 2024 (N= 316)

| **Variables in the Equation** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | S.E. | Wald | Df | Sig. | AOR | 95% C.I for EXP(B) | |
| | | | | | | | | Lower | Upper |
| | Marital status(divorced) | | | 4.679 | 3 | .197 | | | |
| | Marital status (1)(single) | -1.406 | .869 | 2.614 | 1 | .106 | .245 | .045 | 1.348 |
| | Marital status (2)(married) | -1.077 | .892 | 1.459 | 1 | .227 | .341 | .059 | 1.955 |
| | Marital status (3)(widowed) | .068 | 1.386 | .002 | 1 | .961 | 1.070 | .071 | 16.174 |
| | Work place group(OPD) | | | 2.367 | 3 | .500 | | | |
| | Work place group (1)(ICU) | -.665 | .524 | 1.611 | 1 | .204 | .514 | .184 | 1.436 |
| | Work place group (2)(Emergency) | -.750 | .655 | 1.314 | 1 | .252 | .472 | .131 | 1.704 |
| | Work place group (3)(IPD) | -.218 | .375 | .337 | 1 | .562 | .804 | .386 | 1.678 |
| | Alcohol drinking (1)(yes) | .882 | .380 | 5.397 | 1 | **.020** | **2.416** | **1.148** | **5.086*** |
| | Physical activity in facility(no) | | | 2.994 | 2 | .224 | | | |
| | Physical activity in facility (1) | -20.909 | 40192.970 | .000 | 1 | 1.000 | .000 | .000 | . |
| | Physical activity in facility (2)(yes) | -.848 | .490 | 2.994 | 1 | .084 | .428 | .164 | 1.119 |
| | Sitting time (1) (< 4 hour) | -.906 | .309 | 8.622 | 1 | **.003** | **.404** | **.221** | **.740*** |
| | Constant | .447 | .937 | .228 | 1 | .633 | 1.564 | | |

# 6. DISCUSSION

Physical activity is widely recognized for its positive effects on health, including reducing the risk of chronic diseases, improving mental health, and enhancing overall quality of life. For nurses, regular exercise can be particularly beneficial, helping to mitigate job-related stress, reduce the risk of burnout, and improve physical resilience. However, the irregular hours and emotional toll of nursing can make maintaining a regular exercise regimen challenging. This is compounded by the fact that shift work, common in nursing, disrupts circadian rhythms, making it harder to establish and stick to a consistent exercise schedule.

In general, the majority of the study participants, 81.2% achieved recommended levels of physical activity. This study result concludes that all studies done around the globe aimed to assess the level of physical activity among nurses. The current study result was higher than a study in Malaysia, 67.2 %, and lower than a study in France (94.3%) and Spain (93.72%) (32, 33, 39).

In the area of healthcare professionals, nurses stand at the front position, facing high demands both physically and emotionally. A recent study on the physical activity status among nurses' factors that influence their engagement in exercise and physical activities. One of the most striking findings from this research is the significant correlation between alcohol consumption and physical activity levels among nurses. Specifically, the study indicates that nurses who abstain from alcohol are 2.416 times more likely to engage in physical activity compared to their counterparts who consume alcohol. This finding is in line with a study done among nurses in Malaysia (39).

In the Taiwanese study, a significant portion of public health nurses reported engaging in vigorous (39.54%) and moderate (49.42%) physical activities. However, these nurses also reported a high average daily sedentary time of 8.05 hours. This contrast suggests a polarized pattern of activity, where periods of intense physical activity are interspersed with prolonged sedentary phases, possibly due to the nature of administrative and clinical responsibilities that

require long durations of sitting. In comparison, data from the United States shows a slightly lower engagement in vigorous physical activities (37.5%) among public health nurses, with an even lower rate of moderate physical activities (35.2%). In another study of American nurses also reported a lower average daily sedentary time of 6 hours. This study shows a markedly higher engagement in both vigorous (57.6%) and moderate (64.6%) physical activities among nurses, coupled with a significantly lower average daily sedentary time of just 3.96 hours. This indicates a more consistently active lifestyle among nurses in our study, which could be reflective of differing work routines or cultural attitudes towards physical activity within healthcare settings. These disparities in physical activity levels and sedentary behavior could have significant implications for public health policies targeted at healthcare professionals. It raises questions about the impact of workplace environments, cultural norms, and health promotion strategies within the nursing profession across different global contexts (30, 33).

On a broader scale, this research contributes to the ongoing conversation about sedentary lifestyles and their health implications. It reinforces the importance of physical activity for everyone, including professionals in high-stress, time-constrained roles like nursing. Encouraging a culture of wellness that prioritizes regular movement, even in small increments, could have profound benefits. For nurses, integrating physical activity into their routines not only has the potential to improve their health outcomes but also positions them as role models of healthy living for their patients. As we move forward, healthcare systems and professionals alike must recognize the importance of combating sedentary habits as part of a holistic approach to health and well-being.

# 7. CONCLUSION AND RECOMMENDATION

## 7.1Conclusion

The study finding concludes nurses' habits of physical activity improved from the previous study in Malaysia and lower from studies in France and Spain. However, the present level of physical activity of nurses is not adequate since they are considered as role models for the community. Nurses' sitting time during the day and alcohol-drinking behavior are attributed to physical activity. The level of physical activity can be increased by enhancing staff motivation towards physical activity and by establishing a physical activity room at the institution.

This study found a high prevalence of physical activity among nurses in Addis Ababa. Longer sitting time was associated with low physical activity levels. Logistic and multiple regression showed that nurses whose behavior not drinking alcohol were 2.416 times more likely to engage in physical activity compared with alcohol-drinking behavior [AOR=2.416; 95% CI=1.148 - 5.086]. The study showed that respondents who spent time by sitting less than 4 hours were 0.404 times less likely to engage in physical activity compared to those who spent time by sitting more than 4 hours [AOR=0.404; 95% CI= 0.221 - 0.740].

## 7.2 Recommendation

For policymakers, it is crucial to recognize the importance of integrating physical activity into the routines of nurses. By understanding the benefits of physical activity on both physical and mental health, policymakers can implement policies and initiatives that support and encourage nurses to continue engaging in regular physical activity. This could include providing resources for short, high-intensity interval training (HIIT) sessions that can be easily incorporated into their busy schedules. Additionally, policymakers should prioritize the recognition and support of physically active nurses within the healthcare system.

Hospitals play a vital role in promoting physical activity among their staff members. They should prioritize the well-being of their nurses by encouraging and facilitating physical activity. This can be achieved by providing access to fitness facilities, offering guidance on incorporating physical activity into their routines, and creating a supportive environment that values and

recognizes physically active nurses. By doing so, hospitals can contribute to the overall health and wellness of their nursing staff.

Nurses themselves, who often face long hours and stressful environments, can greatly benefit from integrating physical activity into their daily lives. Engaging in regular physical activity can improve their physical fitness, reduce stress levels, and enhance their overall well-being. Short, high-intensity interval training (HIIT) sessions can be particularly beneficial for nurses due to the time constraints of their demanding schedules. Physically active nurses should also take on the role of guiding and encouraging inactive colleagues to prioritize physical activity.

For researchers, studying the impact of physical activity on nurses' health is essential. By conducting research on the benefits of physical activity for nurses, researchers can provide evidence-based recommendations for integrating physical activity into their routines. This research can help inform policymakers, hospitals, and nurses themselves about the importance of prioritizing physical activity and provide insights into effective strategies for implementation.

In conclusion, integrating physical activity into the routines of nurses is crucial for their overall well-being. Policymakers should recognize and support physically active nurses, while hospitals should create a supportive environment that encourages and facilitates physical activity. Nurses themselves should prioritize physical activity and guide inactive colleagues. Researchers play a vital role in studying the impact of physical activity on nurses' health and providing evidence-based recommendations. By working together, policymakers, hospitals, nurses, and researchers can promote a culture of physical activity that benefits the entire nursing profession.

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## Appendixes

An information-gathering questionnaire was designed regarding the physical activity status of and factors affecting nurses working at selected public hospitals, in Addis Ababa, Ethiopia.

**Consent form**

I, the undersigned, am confirming that I am going to be part of the study as understand the following statements. I understand that the study is owned by Samrawit Tariku, an MSc student at AAU. The study aims to assess physical activity status and factors affecting it among nurses working at selected Hospitals in Addis Ababa, Ethiopia, 2024.

**Significance of the study**: The study helps to show the status and factors affecting physical activity among nurses. It has a significant contribution to nurses, Hospitals, policymakers, and researchers. Nurses can identify areas for improvement and develop strategies to enhance their overall health and well-being. Additionally, hospitals can potentially enhance their work performance, reduce absenteeism, and improve patient care outcomes and also it can inform the development of workplace policies and initiatives that promote a more active lifestyle, such as providing access to fitness facilities, offering wellness programs, or implementing walking breaks during shifts. Moreover, policymakers like the Ministry of Health and regional health bureaus to take further actions that encourage physical activity at work workplace like designing and building gymnastics/sports clubs in every health institution. It also serves as background/baseline information for future research.

**Confidentiality**: All information that I give is kept confidential and won't be accessible to any third party. my name won't be registered on the question sheet, so I not be identified.

**Risks and Benefits of the Study**: The study is prepared in the form of a semi-structured interview-based questionnaire. The procedure doesn't cause any physical or psychological trauma to me. Furthermore, I understand that there is no force or coercion to respond to the questions. There is no payment for participation in the study but participating in the study has great input to improve the status of physical activity and factors affecting it among nurses working in public hospitals, in Addis Ababa, Ethiopia.

They make sure that there is no harm caused because I am involved in this study, I also have the full right to decline the interview, partly or totally.

**Assent**: I have fully understood the contents, and I have agreed to participate in this research project and confirm it by signature.

Signature _____

Date _____

Thank you for giving us your consent.

Name of data Collector_____ sign_____ Date_____

Date of questionnaire collection …….

Questionnaire ID number…….

| No. | Question | Response (Options) | Remark |
|---|---|---|---|
| socio-demographic, behavioral, and work /employment characteristics | | | |
| 1. | How old are you? | [__ __] years | |
| 2. | What is your sex? | 1. Male<br>2. Female | |
| 3. | Which department you are working in now? | | |
| 4. | working shift | 1. Day only<br>2. Night only<br>3. Rotating | |
| 5. | Shift length | 1. 8 hours<br>2. 16 hours<br>3. Mixed | |
| 5. | What is your marital status? | 1. Single<br>2. Married/cohabiting<br>3. Widowed<br>4. Divorced/separated | |
| 7. | What is your education level? | 1. Diploma<br>2. Degree<br>3. Masters and above | |

| | | | |
|---|---|---|---|
| 8. | Monthly income (salary) | 1. 4500-7500<br>2. 7501-10,500<br>3. 10,501-13,500<br>4. 13,501-16,500 | |
| 9. | Did you smoke cigarettes? | 1. Yes<br>2. No | |
| 10. | Did you drink alcohol? | 1. Yes<br>2. No | |
| 11. | Is there an available physical activity facility in your institution? | 1. Yes<br>2. No | |

| Physical activity | | |
|---|---|---|
| Next, I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.<br>Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, and seeking employment. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, and 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate. | | |
| Activity at work | | |
| No | Question | Response |
| 1. | Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, jogging/] for at least 10 minutes continuously? | Yes<br><br>No, if no go to question No. 4 |

| | | |
|---|---|---|
| 2. | In a typical week, on how many days do you do vigorous-intensity activities as part of your work? | Number of days ……. |
| 3. | How much time do you spend doing vigorous-intensity activities at work on a typical day? | ……. hour,……minutes |
| 4. | Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously? | Yes<br>No, if no go to question No. 7 |
| 5. | In a typical week, on how many days do you do moderate-intensity activities as part of your work? | Number of days ……. |
| 6. | How much time do you spend doing moderate-intensity activities at work on a typical day? | ……hour,..…minutes |
| Travel to and from places | | |
| The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to a place of worship. | | |
| 7. | Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? | Yes<br>No, if no, go to question No 10 |
| 8. | In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? | Number of days ……. |
| 9. | How much time do you spend walking or bicycling for travel on a typical day? | Hour….. minutes…….. |
| Recreational activities | | |
| The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure), | | |
| 10. | Do you do any vigorous-intensity sports, fitness, or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football,] for at least 10 minutes continuously? | Yes<br>No, if no, go to question No. 13 |

| | | |
|---|---|---|
| 11. | In a typical week, how many days do you do vigorous-intensity sports, fitness, or recreational (leisure) activities? | Number of days …….. |
| 12. | How much time do you spend doing vigorous-intensity sports, fitness, or recreational activities on a typical day? | Hour ….., minutes …… |
| 13. | Do you do any moderate-intensity sports, fitness, or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, (cycling, swimming, volleyball) for at least 10 minutes continuously? | Yes<br>No, if no, go to question No.16 |
| 14. | In a typical week, how many days do you do moderate-intensity sports, fitness, or recreational (leisure) activities? | Number of days …….. |
| 15. | How much time do you spend doing moderate-intensity sports, fitness, or recreational (leisure) activities on a typical day? | Hour ……., minutes …… |
| Sedentary behavior | | |
| The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent [sitting at a desk, sitting with friends, traveling in a car, bus, train, reading, playing cards or watching television], but do not include time spent sleeping. | | |
| 16. | How much time do you usually spend sitting or reclining on a typical day? | Hour ….. minutes ……. |