ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

A Study to Determine Levels of Physical Activity among Health Care Professionals in Bangalore – A Survey

[1]Zubiya Naazs.; [2]Dr. Smruti Swagatika Dash; [3]Dr. Rajendra Kachhwaha,

[1]MPT Musculoskeletal Sciences, [2]Professor, NHIP, [3]Principal, NHIP
Narayana Hrudayalaya Institute of Physiotherapy, Bangalore

Publication Date: 2025/02/10

Abstract:

- ***Introduction***

Physical activity (PA) is essential for maintaining good health. One of the main risk factors for chronic illnesses, non-communicable diseases (NCDs), overweight, and obesity is physical inactivity. Physical inactivity contributes to mortality and disability since it has been associated with an increased incidence of non-communicable diseases (NCDs). According to data from research on medical professionals, the prevalence of PI varies between 34.8% and 87.8%. To quantify many aspects of physical activity, the International Physical Activity Questionnaire (IPAQ) was created in 1997 as a monitoring tool. To express the intensity and energy expenditure of activities in a way that is comparable among people of different weights, the metabolic equivalent task (MET) is utilised. Our goal was to assess the level of Physical Activity among the healthcare professionals working in a tertiary facility in Bangalore, India.

- ***Methods***

Using the International Physical Activity Questionnaire-long form (IPAQ-LF), a survey study was conducted. The study comprised 299 young adults between the ages of 25 and 45. The total MET min of activity for each domain was added to determine the levels of physical activity. Following that, the calculated activity levels were categorised as low, moderate, or high.

- ***Results***

A total of 299 healthcare professionals were recruited, comprising 33.4% allied health care workers, 22.4% nurses, 14% physicians and 30.1% physiotherapist. Means age was 28.62, 14%, 32%, 54% of the healthcare professionals had low, moderate or high physical activity levels respectively.

- ***Conclusion***

Among the four groups of HCPs, Nurses and Physiotherapists generally show better physical activity levels when compared to the other groups. Physiotherapists (35.6%) have higher percentages with a BMI of 25 or greater were physically active. These HCPs appear to be at risk for NCDs based on their low PA levels. There is an urgent need to establish programs to increase PA among HCPs.

Keywords: *Physical Inactivity, Physical Activity, Non-Communicable Diseases, Health Care Professionals, International Physical Activity Questionnaire, Body Mass Index.*

How to Cite: R. Sarada; Budigina Keerthana; Gunnada Meghana; Kolipakula Swetha; Borra Satya Padmaja (2025). Enhancing Employability through Collaborative Project-Based Learning. *International Journal of Innovative Science and Research Technology*, 10(1), 2005-2011. https://doi.org/10.5281/zenodo.14836673

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

I. INTRODUCTION

Physical inactivity is acknowledged as a major risk factor for chronic illnesses, non-communicable diseases (NCDs), overweight, and obesity.[1]

Physical inactivity (PI) is one of the major public health concerns of the twenty-first century and the fourth most significant global risk factor for mortality. According to the World Health Organisation, 31% of adults worldwide are physically inactive, and 3.2 million people worldwide pass away each year as a result of their physical inactivity. Lack of physical activity among health workers is a concern, as they are in a strategic position to raise awareness of active lifestyles among the population. Several factors, such as unfavourable working conditions, duration of work and type of work can influence health care professionals' lifestyles.[2]

According to a 2012 study, physical inactivity is directly linked to 6–10% of deaths globally from NCDs. Increased physical activity, on the other hand, is one of the most important risk factors and helps prevent NCDs. Over 80% of chronic disease-related deaths take place in low- and middle-income nations [LMC]. According to recent estimates, physical inactivity causes over 2 million deaths globally each year, and physical activity has been termed "the best public health purchase." As a result, there is growing prevalence of NCD which is affecting economy of many countries.[3,4,5]

Considering that according to the most recent data avai lable worldwide, one in four (27.5%) persons do not engage in the recommended amount of aerobic exercise as stated in the 2010 Global Recommendations on Physical Activity for Health.[6]

The World Health Organisation (WHO) defines physical activity as "any bodily movement produced by skeletal muscles that requires energy expenditure -- including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits."[7]

Research shows that medical professionals don't engage in enough physical activity. According to a recent study conducted in Kerala by the Indian Medical Association, the life expectancy of doctors was found to be 61.75 years, comparatively shorter than that of the general population, which was 74.9 years. The widespread perception that because health care providers were more knowledgeable than the general population, they lived longer lives was disproved by these findings. Given that "sitting is the new smoking," it is critical to comprehend the reasons for the sedentary lives of health-care professionals.[8]

WHO recommendation for physical activity:

Adults between the ages of 18 and 64

- It is recommended that individuals engage in a minimum of 150 minutes of moderate-intensity physical activity per week, or 75 minutes of vigorous-intensity physical activity per week, or an equivalent mix of both.
- Adults should increase their weekly moderate-intensity physical activity to 300 minutes or more for further health advantages.
- At least two days a week should be dedicated to muscle-strengthening exercises that target the major muscle groups.[9]

Although the benefits of physical activity are well known, 27.5% of individuals globally do not meet the levels of physical activity that are advised by public health guidelines. The United Nations has set several Sustainable Development Goals (SDGs) for 2030 that could be achieved by physical activity. For example, increasing physical activity can directly assist SDG (good health and well-being) by reducing the rate of non-communicable diseases that cause premature death.[10,11]

The health benefits associated with physical activity are widely recognized, and recommendations have been made for physical activity to maintain and improve health.[4]

An international consensus group developed the International Physical Activity Questionnaire (IPAQ) approximately at the end of the 1990s, and it is being utilised increasingly. Consequently, it is a reliable tool for assessing physical activity that enables cross-national comparisons and examines physical activity in its whole (at work, at home, and in relation to transportation and hobbies). [12]

Some studies have shown the levels of PA among various professions which are sedentary by nature. The degree of physical activity among various healthcare professionals who work long hours and remain in a stationary position, like sitting or standing, has been the subject of very few research. Hence this study is to determine the levels of physical activity among healthcare professionals in Bangalore, India.

II. METHODS

This survey study was carried out among various hospitals in Bangalore, India between December 2023 and January 2024. The facilities of Bangalore's corporate hospitals provided a range of services, including clinical, teaching, research, and consultation. This study comprised of 100 allied healthcare workers, 67 nurses, 42 physicians, and 90 physiotherapists.

SO Iwuala et. al (2015) conducted a cross-sectional study "Self-reported physical activity among health care professionals in South-West Nigeria". The mean age of the HCPs was 39.2 (9.0) years, 185 (62.1%) were below 40 years of age; taking the age group of less than 40, at 5% level of significance and 7.5% estimated error, using the prevalence of 62% at 95% confidence interval, sample size obtained was 299.[13]

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

Ethical clearance was obtained from Narayana health academics committee (NHAEC), A successful return of the survey questionnaire was considered as consent by the participants; no additional investigations were needed for my study; and participant privacy and confidentiality was maintained. Study participation was entirely voluntary.

III. DATA COLLECTION

An online survey was developed through Google forms. The International Physical Activity Questionnaire Long-form (IPAQ-LF) and a series of demographic questions were developed for the study of Bangalore-based health care professionals aged 25 to 45. There are five sections and a total of 27 questions that assess walking, sitting time, moderate-intensity exercise, and vigorous-intensity activity. All of the questions are connected to the physical activity that the participant has been doing over the past seven days. An overall estimate of PA in a week was calculated by multiplying these activity categories by their estimated intensity in metabolic equivalents (METs) and adding them up (www.ipaq.ki.se). One MET is equal to 3.5 ml/kg/min of oxygen volume (VO2) and is the amount of energy used while sitting quietly at rest. The MET intensities used to score IPAQ in this study were vigorous (8 METs), moderate (4 METs), and walking (3.3 METs).[14]

Since participation was entirely optional, they were free to renounce or quit at any moment. The research's objectives and methodology were explained to the participants. Weight (kg) divided by height (m2) was used to get the body mass index (BMI). The principal investigator gathered the data.

IV. DATA ANALYSIS

The WHO weight standards were used to categorise BMI.[15] Obese people had a BMI of ≥30 kg/m2, while overweight people had a BMI of 25 to 29.9 kg/m2.

Using the IPAQ processing standards, physical activity levels were categorised as low, moderate, or high intensity.[16] Low PA: either no activity was reported or there was some activity, but not enough to meet the other activity categories' requirements; Any one of the three factors listed below indicates moderate PA: (a) 3 or more days of vigorous-intensity activity lasting at least 20 min/day, (b) 5 or more days of moderate-intensity activity or walking lasting at least 30 min/day, or (c) 5 or more days of any combination of walking, moderate-intensity, or vigorous-intensity that results in a weekly total of at least 600 MET-min; High PA is determined by one of the two criteria listed below: (a) 3 or more days of vigorous – intensity activity accumulating at least 1500 MET- min per week or (b) 7 days of any combination of walking or moderate or vigorous- intensity activities achieving a minimum of 3000 MET- min per week.[17]

Data was cleaned using Microsoft Excel, and statistical analysis was conducted using R programming version 4.3.1 and SPSS version 27, the statistical package for social sciences. Frequencies and percentages were used to express each of the categorical variables. The mean and standard deviation are used to express all continuous variables. When comparing categorical data, the chi-square test was employed as the significance test. A p-value of <0.05 was considered as statistically significant.

V. RESULTS

There were 299 HCPs studied, made up of 100 allied healthcare workers, 67 nurses, 42 physicians, and 90 physiotherapists.

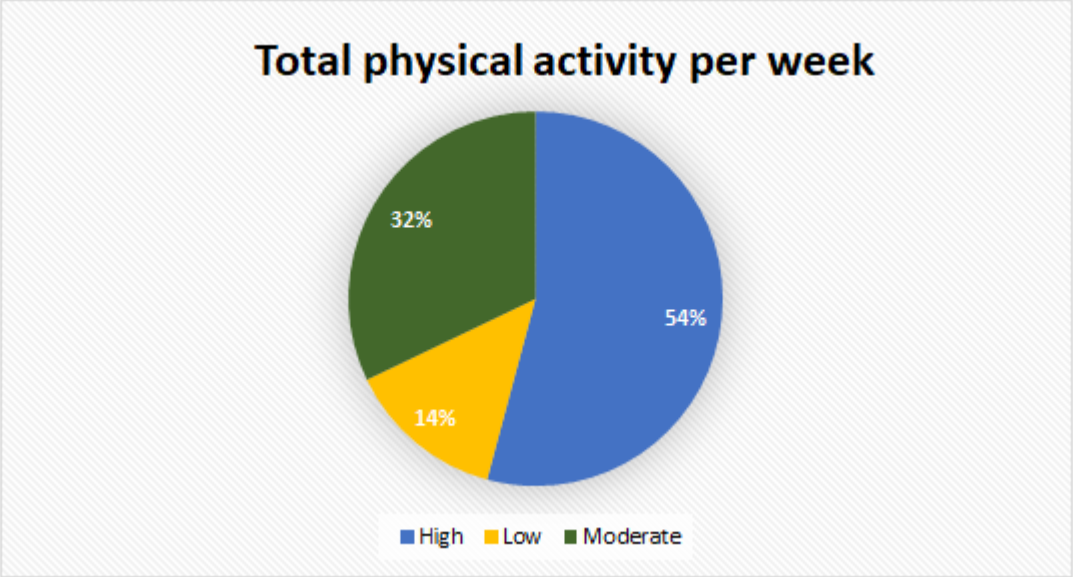
The mean age (28.62) and standard deviation (4.39) of the continuous data pertaining to health care professions.

Table 1 The Distribution of Categorical Data among HCP (n=299) is based on Group, Gender, BMI, and PA Domains. The Majority of Participants (100, or 33.4%) were from the Allied Health Care Workers, Followed by Physiotherapists (90, or 30.1%), Nurses (67, or 22.4%), and Doctors (42, or 14%).

Sl. No	Parameter	N (299)	% (100)
1	Group		
	Allied Healthcare workers	100	33.4
	Nurses	67	22.4
	Physicians	42	14
	Physiotherapist	90	30.1
2	Gender		
	Female	206	68.9
	Male	93	31.1
3	BMI		
	< 25	215	71.90
	≥ 25	84	28.1
4	Total Walking		

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

	High	78	26.1
	Low	103	34.4
	Moderate	118	39.5
5	Total Moderate		
	High	29	9.7
	Low	191	63.9
	Moderate	79	26.4
6	Total Vigorous		
	High	23	7.7
	Low	253	84.6
	Moderate	23	7.7
7	Total Physical Activity		
	High	162	54.2
	Low	41	13.7
	Moderate	96	32.1



Graph-1: (Shows the Total Physical Activity among Health Care Professionals Per Week)

It shows the pie-chart representation of total physical activity for each group of healthcare professionals, with total physical activity being categorised as high (54%), moderate (32%) and low (14%).

VI. INFERENTIAL STATISTICS

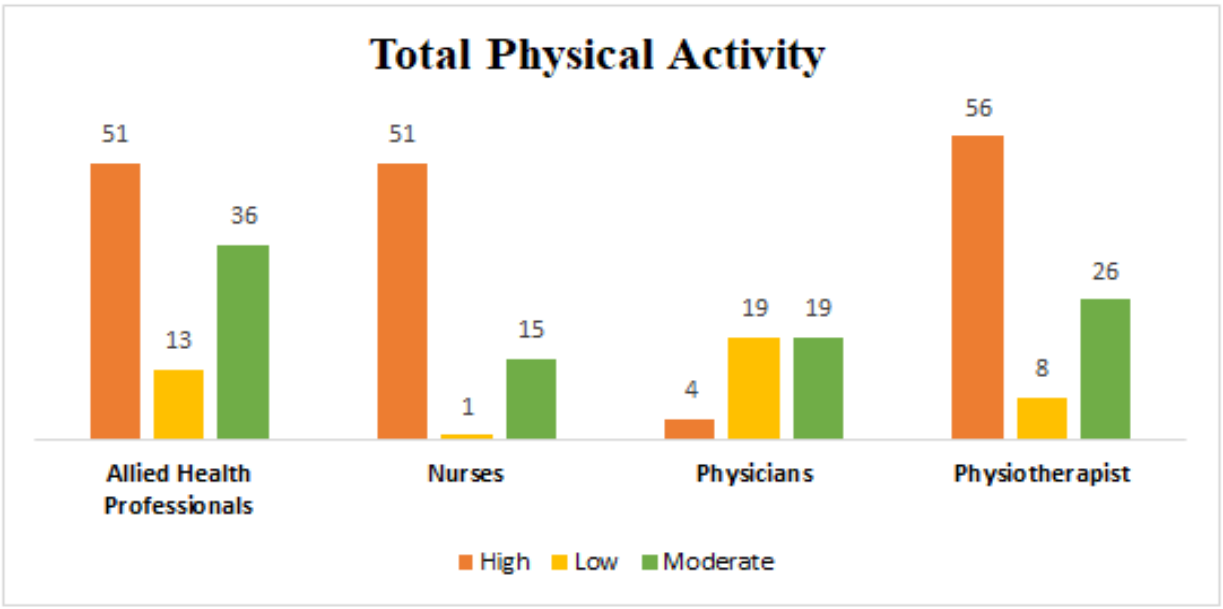
Table 2 The inferential statistics comparing outcome measures showing P Value among HCP (n=299) based on gender, BMI, and PA domains. The p-value of 0.461 indicates that the differences in gender distribution across these groups are not statistically significant. The p- value for BMI, Total walking, Total moderate, Total Vigorous, and Total Physical Activity indicating p-value of <0.001 showing statistical significance between the groups.

Sl. No	Parameter	Allied Health Care worker		Nurses		Physicians		Physiotherapist		P-Value
		N	%	N	%	N	%	N	%	
1	**Gender**									
	Female	66	66	50	74.6	26	61.9	64	71.1	0.461

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

	Male	34	34	17	25.4	16	38.1	26	28.9	
2	**BMI**									
	< 25	78	78	54	80.6	25	59.5	58	64.4	<0.001*
	≥ 25	22	22	13	19.4	17	40.5	32	35.6	
3	**Total Walking**									
	High	16	16	26	38.8	2	4.8	34	37.8	<0.001*
	Low	26	26	12	17.9	34	81	31	34.4	
	Moderate	58	58	29	43.3	6	14.3	25	27.8	
4	**Total Moderate**									
	High	7	7	20	29.9	0	0	2	2.2	<0.001*
	Low	62	62	27	40.3	32	76.2	70	77.8	
	Moderate	31	31	20	29.9	10	23.8	18	20	
5	**Total Vigorous**									
	High	4	4	4	6	0	0	15	16.7	<0.001*
	Low	95	95	60	89.6	38	90.5	60	66.7	
	Moderate	1	1	3	4.5	4	9.5	15	16.7	
6	**Total Physical Activity**									
	High	51	51	51	76.1	4	9.5	56	62.2	<0.001*
	Low	13	13	1	1.5	19	45.2	8	8.9	
	Moderate	36	36	15	22.4	19	45.2	26	28.9	

Statistical software: SPSS version 27; Statistical test: Chi-Square Test; P-Value <0.05 Significant*



Graph- 2: (Shows the Representation on Total Physical Activity between the Individual Groups)

Graph 1 shows a graphical representation of the comparisons between the HCPs groups for total physical activity, were Allied healthcare worker had high (51%), moderate (15%), and low (13%) physical activity, followed by nurses with high (76.1%), moderate (22.4%), and low (1.5%), doctors with high (9.5%), moderate (45.2%), and low (45.2%), and physiotherapists with high (62.2%), moderate (28.9%), and low (8.9%) physical activity.

VII. DISCUSSION

To our best understanding, this research stands as one among the limited investigations focused on physical activity levels among various healthcare professionals in Bangalore, India. A total of 311 samples were gathered, from which 299 individuals met the criteria to put down in the study. Upon collecting the survey data from participants,

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

their physical activity levels were assessed based on domains of physical activity and the weekly duration in minutes, resulting in physical activity levels expressed in MET minutes per week.

Hazizi Abu Saad et al. (2020) discovered in their research that males exhibited considerably greater levels of physical activity than females.18 Similarly, a study by Ngarambe R et al. (2011) indicated that 50% of males were more active compared to only 21.8% of females.19 In the current analysis, due to the higher number of female participants relative to males, we were unable to assess physical activity from a gender perspective.

In another investigation, Skaal L, Pengpid S. et al. (2011) found a negative correlation between body mass index (BMI) and physical activity levels, noting that obese female healthcare participants tended to be less active.20 The findings of this study showed that nurses and allied healthcare workers had a lower BMI (>25) when compared to physicians and physiotherapists who had a BMI (>25). While allied healthcare workers had a smaller BMI than physiotherapists, it was observed that physiotherapists were more physically active than their allied counterparts.

This research revealed that physiotherapists (62.2%) demonstrated the highest overall physical activity percentages, particularly excelling in vigorous activities. Conversely, studies from other regions indicated that physiotherapists engaged in more vigorous physical activities and walking.21

Nurses in this study (76.1%) showcased a higher percentage of overall activity similar to physiotherapists, showing significant levels of moderate activity. However, a study on the physical activity behavior of nursing professionals highlighted that the overall leisure time physical activity was only 10.2%, suggesting that nurses did not participate sufficiently in leisure physical activities.22

This research found that allied healthcare workers showed a moderate level of total physical activity (51%). In a different investigation into physical activity levels among allied healthcare workers in a major Australian metropolitan health district, it was reported that 86% to 94% met the minimum standard of over 600 MET minutes per week as per AAS and IPAQ-L.23

In the present study, the physical activity levels across the four groups illustrate that nurses and physiotherapists generally maintain better activity levels in most categories. Nurses exhibit higher levels of moderate and overall physical activity, whereas physiotherapists stand out in vigorous activities. Physicians seem to be the least active group, particularly in terms of walking and moderate activities, and they also possess a higher BMI compared to the other groups. Allied healthcare workers showed a moderate range of overall walking and physical activity levels.

MET serves to quantify the intensity and energy usage of various activities in a manner that allows for comparison between individuals with varying weights. The true amount of energy expended (measured in calories or joules) during an activity is influenced by an individual's body weight; as a result, the energy required for identical activities will vary among individuals with distinct weights.17

Consequently, the results from the present research indicated that a significant portion of the participants were not physically active in either their occupational or leisure activities.

VIII. LIMITATIONS

- This study's outcome measure, the International Physical Activity Questionnaire (IPAQ), is a self-reported survey; hence, one of its drawbacks is that respondents often over-report their responses.
- The study would be more accurate if electronic devices such as accelerometer was used.
- Additionally, the gender distribution was not even in the population. Also, the participants were not evenly distributed among the chosen four different professions.
- The study only found out PA levels among HCP'S and it didn't specify about the barriers and facilitators.

IX. FUTURE RECOMMENDATION

The outcomes of this research suggest an immediate need for a health-enhancing program tailored for age and gender to mitigate the dangers posed by a lack of physical activity among health workers. Promoting physical activity is particularly crucial for physiotherapists, who possess specialized knowledge in movement science and in the prevention of non-communicable diseases, as well as in health promotion. The demanding work schedules of healthcare professionals in India may be attributed to shortages in infrastructure or workforce, which limits their ability to engage in a sufficient level of physical activity despite their awareness of the importance of staying fit.

X. CONCLUSION

A significant number of healthcare professionals participated in low levels of physical activity, primarily involving work-related tasks, walking, cycling, and recreational or fitness activities. Among the four groups, Nurses and Physiotherapists generally show better physical activity levels across most categories. Physiotherapists are skilled in intense physical activities, whereas nurses have greater levels of moderate and total physical activity. Compared to the other groups, physicians seem to be the least active, especially when it comes to walking and moderate activities. They also have a higher BMI. The Allied health care workers engage in a moderate amount of overall physical activity and walking. were assessed based on domains of physical activity and the weekly duration in minutes**,** resulting in physical activity levels expressed in MET minutes per week**.**

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14836673

REFERENCES

[1]. Cunningham C, O'Sullivan R, Caserotti P, Tully MA. Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses. Scandinavian journal of medicine & science in sports. 2020 May;30(5):816-27.

[2]. Leisure-time physical inactivity among healthcare workers Saulo V. Rocha , Aline R. Barbosa , Tania M. Araújo

[3]. World Health Organization. Preventing chronic disease: a vital investment. who global report. Geneva WHO; 2005.

[4]. Sisson SB, Katzmarzyk PT. International prevalence of physical activity in youth and adults. Obesity reviews. 2008 Nov;9(6):606-14.

[5]. Mandil AM, Alfurayh NA, Aljebreen MA, Aldukhi SA. Physical activity and major non-communicable diseases among physicians in Central Saudi Arabia. Saudi Med J. 2016 Nov;37(11):1243-1250. doi: 10.15537/smj.2016.11.16268. PMID: 27761564; PMCID: PMC5303803.

[6]. Guthold R, Stevens GA, Riley LM, Bull FC. Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1· 6 million participants. The Lancet Child & Adolescent Health. 2020 Jan 1;4(1):23-35.

[7]. Pate RR. The evolving definition of physical fitness. Quest. 1988 Dec 1;40(3):174-9.

[8]. George LS, Lais H, Chacko M, Retnakumar C, Krishnapillai V. Motivators and Barriers for Physical Activity among Health-Care Professionals: A Qualitative Study. Indian J Community Med. 2021 Jan-Mar;46(1):66-69. doi: 10.4103/ijcm.IJCM_200_20. Epub 2021 Mar 1. PMID: 34035579; PMCID: PMC8117884.

[9]. World Health Organization. (2010). Global recommendations on physical activity for health.

[10]. Guthold R, Stevens GA, Riley LM, et al. Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1·9 million participants. Lancet Glob Health 2018;6: e1077–86.

[11]. United Nations. Transforming our world: the 2030 agenda for sustainable development. New York United Nations; 2015.

[12]. Ekelund U, Sepp H, Brage S, Becker W, Jakes R, Hennings M, Wareham NJ. Criterion-related validity of the last 7-day, short form of the International Physical Activity Questionnaire in Swedish adults. Public health nutrition. 2006 Apr;9(2):258-65.

[13]. Iwuala SO, Sekoni AO, Olamoyegun MA, Akanbi MA, Sabir AA, Ayankogbe OO. Self-Reported Physical Activity among Health Care Professionals in South West Nigeria. Nigerian journal of clinical practice. 2015 Sep 16;18(6):790-5.Burdick L, Mielke GI, Parra

[14]. Afzal S, Altaf M, Nasir M, Bukhari B, Fatima N, Khan S. Metabolic equivalent task assessment for physical activity in students of faculty of allied health sciences, the University of Lahore, Pakistan. Rawal Medical Journal. 2022 Jan 2;47(1):159-.

[15]. World Health Organization. Technical Report Series 854. Physical Status. The Use and Interpretation of Anthropometry. Geneva: WHO; 1995. Available from: http://www.who.int/childgrowth/publications/physical_status/en/. [Last accessed on 2014 Oct 20].

[16]. Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ)-Short and Long Forms; 2005. Available from: http://www.ipaq.ki.se/scoring.pdf.[Last acccessed on 2014 Jul 09].

[17]. Ashok P, Kharche JS, Raju R, Godbole G. Metabolic equivalent task assessment for physical activity in medical students. National Journal of Physiology, Pharmacy and Pharmacology. 2017;7(3):236.

[18]. Abu Saad H, Low PK, Jamaluddin R, Chee HP. Level of Physical Activity and Its Associated Factors among Primary Healthcare Workers in Perak, Malaysia. Int J Environ Res Public Health. 2020 Aug 16;17(16):5947. doi: 10.3390/ijerph17165947. PMID: 32824361; PMCID: PMC7459827.

[19]. Ngarambe R. Physical activity levels and health promotion strategies among physiotherapists in Rwanda.

[20]. Skaal L, Pengpid S. Physical activity, fitness level and health problems of healthcare workers in South Africa: The transtheoretical model as an explanatory framework. African Journal for Physical, Health education, Recreation and Dance 2011;17(4):612- 613.

[21]. McPhail SM, Waite MC. Physical activity and health-related quality of life among physiotherapists: a cross sectional survey in an Australian hospital and health service. Journal of Occupational Medicine and Toxicology. 2014 Dec;9:1-9.

[22]. Wilkerson AH, Thomas HO, Nahar VK. Correlates of physical activity behaviour among nursing professionals: a systematic search. J Health Soc Sci. 2019;4:157-72.

[23]. Zafiropoulos B, Alison JA, Heard R. Physical activity levels of allied health professionals working in a large Australian metropolitan health district–an observational study. Journal of multidisciplinary healthcare. 2019 Jan 3:51-62.