ORIGINAL ARTICLE

Self-reported physical activity among health care professionals in South-West Nigeria

SO Iwuala, AO Sekoni[1], MA Olamoyegun[2], MA Akanbi[3], AA Sabir[4], OO Ayankogbe[1]

Departments of Medicine and [1]Community Health and Primary Care, College of Medicine, University of Lagos, Idi-Araba, Lagos, Lagos State, [2]Department of Medicine, LAUTECH Teaching Hospital, College of Health Sciences, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, [3]Department of Medicine, University of Jos, Plateau State, [4]Department of Medicine, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

Abstract

Introduction: Physical activity (PA) is a key requirement for maintaining good health. There is growing evidence of declining PA worldwide. Physical inactivity is linked with the global obesity pandemic and increasing burden of noncommunicable diseases (NCDs) in developing countries. A barrier to PA counseling by health care providers (HCPs) is personal PA habits. Information regarding PA among HCPs in Nigeria is limited. We aimed to determine the adequacy and predictors of PA among HCPs of a tertiary health care facility in Lagos, Nigeria.

Methods: A cross-sectional study was carried out with the International Physical Activity Questionnaire-Short Form (IPAQ-SF). Using the World Health Organization (WHO) guideline, PA was categorized as adequate or inadequate. Predictors of PA were explored with multivariate logistic regression.

Results: A total of 300 HCPs were recruited, comprising 47.7% doctors and dentists, 43.3% nurses and 9.0% other HCPs. Mean age was 39.9 (9.0 years), 79.2%, 9.7% and 11.1% of the HCPs had low, moderate or high PA levels respectively. Thus, only 20.8% had adequate PA. 71.3% had body mass index (BMI) above the recommended value. BMI of ≥ 25 kg/m^2 was associated with inadequate PA (Adjusted Odds Ratio-2.1, P = 0.018).

Conclusion: Majority of the HCPs had inadequate PA levels according to WHO guidelines. BMI ≥ 25 kg/m^2 was associated with inadequate physical inactivity. The low level of PA implies that these HCPs are at risk for NCDs. This will have a negative impact on availability of human resource for health. There is an urgent need to establish programs to increase PA among HCPs.

Key words: Body mass index, health care professionals, International Physical Activity Questionnaire, Nigeria, physical activity

Date of Acceptance: 12-May-2015

Introduction

The World Health Organization (WHO) recommends that all adults should engage in at least 150 min of moderate-intensity physical activity (PA) or its equivalent per week.[1] PA is linked with lower rates of all-cause mortality,[2] and reduced risk for developing chronic diseases such as hypertension, diabetes, stroke, osteoporosis, cancer, and depression.[3] However, despite the benefits of PA, there is evidence that its levels are declining.[4] Data on PA levels from a WHO study of PA in 22 countries in Africa show a wide variation ranging from 46.8% in Mali in

Address for correspondence:
Dr. Iwuala Sandra Omozehio,
Department of Medicine, College of Medicine, University of Lagos,
Idi- Araba, Lagos. PMB 12003, Nigeria.
E-mail: sandraerhuanga@yahoo.com

Access this article online

Quick Response Code:

Website: www.njcponline.com

DOI: 10.4103/1119-3077.163275

How to cite this article: Iwuala SO, Sekoni AO, Olamoyegun MA, Akanbi MA, Sabir AA, Ayankogbe OO. Self-reported physical activity among health care professionals in South-West Nigeria. Niger J Clin Pract 2015;18:790-5.

West Africa to 96.0% in Mozambique South-Eastern Africa but with no clear reasons for the variation.[5] Two countries in Southeast Africa, Malawi and Mozambique had the highest PA levels (95%), while Mali and Mauritania, two countries located in West Africa had the lowest levels (50%).[5]

In 2009, 17% of the world's population were reported to be physically inactive[6] and by 2012, 31% were physically inactive.[7] Physical inactivity has been identified as the fourth leading risk factor for global mortality, causing an estimated 3.2 million deaths worldwide.[1] Physical inactivity has also been linked to the epidemiologic transition from communicable diseases to chronic noncommunicable diseases (NCDs) in the African continent.[1] Studies on PA levels among Nigerian populations are limited; however, the result of a 2008 systematic review put the prevalence of physical inactivity at 25–57% among Nigerians.[8] A cross-sectional study conducted among an urban Northern Nigerian population found 68.6% to be sufficiently active.[9]

Health care professionals are a respected source of health-related information and are often perceived as role models of healthy lifestyle. However, a barrier to PA counseling by health care professionals is their personal PA habits, with physically inactive persons less likely to provide such information.[10,11]

Several authors have reported PA levels among various categories of health care professionals such as doctors.[12-16] physical therapists[17] and medical students[11,18] in developed countries. Some studies report higher PA levels among these groups compared with the general population,[14,16,17,19,20] suggesting that health care providers (HCPs) are good role models of PA. Other reports suggest that HCPs may not be good role models[12,13] or showed that HCPs were less active than the general population.[21] Among HCPs in Africa, studies have mostly focused on exercise,[22,23] which is a subcategory of PA or used other methods[24] apart from the International PA Questionnaire (IPAQ) in accessing PA. Thus, there is limited data on PA levels among HCPs in Nigeria and sub-Saharan Africa, where the burden of NCDs related to PA activity are on the increase, and the need to engage HCPs to combat the trend of physical inactivity in the populace.

We sought to determine the adequacy of PA among HCPs in a tertiary health facility in Nigeria. We also explored the predictors of PA among the HCPs.

Methods

This cross-sectional study was carried out among different cadres of HCPs of the Lagos University Teaching Hospital, Idi-Araba, Lagos, Nigeria between July and August 2013. LUTH is a 761 bed hospital and the largest of 5 tertiary health care facilities in Lagos State, South-West Nigeria. Lagos State is the commercial nerve center of Nigeria. The facility offers various services such as research, teaching, consultation and clinical services and has a total population of 1629 HCPs, comprised of 712 medical doctors and dentists, 705 nurses, 59 pharmacists, 8 pharmacy technicians, 38 laboratory scientists, 12 physiotherapists, 12 radiographers, 7 social workers, 3 optometrists and 5 dieticians.

Using a prevalence of 25% for physical inactivity among Nigerians,[8] at 95% confidence interval (CI), sample size of 245 was obtained using the Kish and Leslie formula,[25] and appropriate adjustment for a population <10,000.[26] We, however, recruited 300 HCPs.

Multistage sampling was used to select the 300 HCPs in the hospital. The first stage was the stratification of HCPs into their professions. Then proportionate sampling was used to determine the number of HCPs to be selected from each professional category. Respondents from the professional categories were randomly recruited until the desired sample size for that category was achieved. The HCPs who were acutely ill or pregnant were excluded from the study.

Ethical approval for the study was obtained from the Health Research and Ethics Committee of the hospital. Written informed consent was obtained from the study participants. Participation in the study was voluntary.

Data collection

A self-administered questionnaire was used to collect information on the socio-demographic characteristics of the HCPs while at their places of work (clinics, wards, laboratories, offices). The International PA Questionnaire-short form (IPAQ-SF) was used to determine PA levels. The IPAQ-SF consists of 7 items, estimates the time spent being physically active in the last 7 days, and measures vigorous-intensity activities, moderate-intensity activities (not including walking), walking and time spent sitting. These activity categories were multiplied by their estimated intensity in metabolic equivalents (METs) and summed to gain an overall estimate of PA in a week (www.ipaq.ki.se). One MET represents the energy expended while sitting quietly at rest and is equivalent to 3.5 ml/kg/min of volume of oxygen (VO_2). The MET intensities used to score IPAQ in this study were vigorous (8 METs), moderate (4 METs), and walking (3.3 METs).

Anthropometric measurements (height and weight) were also obtained. Height was measured with a portable stadiometer in meters, with the HCP standing erect and the head in the horizontal plane, to within 0.01 m. Weight was measured without shoes, using an electronic scale, the Omron body composition monitor with scale (HBF-500). Privacy of the participants was ensured during the data collection process. Participants were also free to opt out

of the study at any stage. The body mass index (BMI) was calculated as weight (kg)/height (m)^2. The principal investigator and three trained research assistants, who had a minimum of tertiary level education, collected the data.

Data analysis

Physical activity levels were classified as low, moderate, or high intensity according to the IPAQ processing guidelines.[27] Low PA-no activity or some activity reported, but not enough to satisfy the requirements of the other activity categories; Moderate PA – any of the following three criteria: (a) 3 or more days of vigorous-intensity activity for at least 20 min/day, (b) 5 or more days of moderate-intensity activity or waking for at least 30 min/day, or (c) 5 or more days of any combination of walking, moderate-intensity, or vigorous-intensity activities achieving a minimum of 600 MET-min per week; High PA – either of the following two criteria: (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.

These three groups were then categorized as adequate or inadequate PA. The adequate PA group included participants in the moderate- or high-intensity categories who met the WHO PA recommendation.[28] BMI was categorized according to the WHO weight criteria.[29] Overweight persons had a BMI 25–29.9 kg/m^2 and obese persons ≥30 kg/m^2.

The medical doctors and dentists were grouped together as doctors. Other health service providers apart from the nurses were merged and referred to as "others."

Microsoft Excel was used for cleaning the data while statistical analysis was done using the statistical package for social sciences, SPSS version 20.0 (IBM SPSS Inc. Chicago Illinois, USA). Continuous variables were expressed as means and standard deviation or median and interquartile range (IQR). Categorical variables were expressed as frequencies with accompanying percentages. Differences between groups were compared using the Chi-square and Fisher's exact test for categorical variables. Odds ratio and the corresponding 95% CI were presented. Multivariate logistic regression was used to determine the predictors of PA. The factors that had a $P < 0.10$ on bivariate analysis were put into a model to adjust for confounding factors. Statistical significance was set at $P < 0.05$.

Results

There were 300 HCPs studied, made up of 131 doctors, 12 dentists, 130 nurses, 12 pharmacists, 2 physiotherapists, 7 laboratory scientists, 1 optometrist, 1 dietician, 1 pharmacy technician, 1 radiographer and 1 social worker. Analysis was based on 298 HCPs as 2 HCPs responses were voided according to IPAQ guidelines.

The basic characteristics of the HCPs are shown in Table 1. The mean age of the HCPs was 39.2 (9.0) years, 185 (62.1%) were below 40 years of age; 197 (66.1%) were female, 152

Table 1: Characteristics of the study population

Variable	*n* (%)
Age (years)	
≤40	185 (62.1)
>40	113 (37.9)
Mean age	39.2 (9.0)
Sex	
Female	197 (66.1)
Male	101 (33.9)
Marital status	
Single	57 (19.1)
Married/separated/widowed	241 (80.9)
Ethnic group	
Yoruba	172 (57.7)
Igbo	82 (27.5)
Others	44 (14.8)
Average monthly salary (naira)	
≤200,000	149 (50.0)
201,000-400,000	123 (41.3)
>400,000	26 (8.7)
Number of years of experience	
<5	43 (14.4)
5-10	103 (34.6)
>10	152 (51.0)
BMI category (kg/m^2)	
<18.5	2 (0.7)
18.5-24.9	82 (27.5)
25-29.9	133 (44.6)
≥30	81 (27.2)
Mean BMI	27.7 (4.6)

BMI=Body mass index

Table 2: Physical activity levels and adequacy of PA of the HCPs

Variable	Frequency (%)	Median MET (min/week)	*P*
Physical activity levels			
Low	236 (79.2)	396.0 (198.0-886.5)	0.0001
Moderate	29 (9.7)	1653.0 (1302.0-2407.5)	
High	33 (11.1)	4158.0 (3348.0-5493.0)	
Adequacy of PA			
Adequate PA level	62 (20.8)	3181.5 (1666.0-4200.0)	<0.0001
Inadequate (low PA)	236 (79.2)	396 (198.0-885.5)	
Median time spent sitting (h)			
Adequate PA level	4.0 (3.0-6.0)		0.319
Inadequate	4.5 (3.0-6.0)		

PA=Physical activity; MET=Metabolic equivalent, HCPs=Health care providers

Table 3: Association of physical activity level with sociodemographic characteristics and BMI

Variable	Adequate PA (*n*=62)	Inadequate PA (*n*=236)	*P*
Age (years)			
≤40	45 (24.3)	140 (75.7)	0.056*
>40	17 (15.0)	96 (85.0)	
Mean (SD) age	36.7 (8.0)	39.9 (9.1)	0.013*
Sex			
Female	45 (22.8)	152 (77.2)	0.226
Male	17 (16.8)	84 (83.2)	
Marital status			
Single	17 (29.8)	40 (70.2)	0.062*
Married/separated/widowed	45 (18.7)	196 (81.3)	
Ethnic group			
Yoruba	33 (19.2)	139 (80.8)	0.045*
Igbo	24 (29.3)	58 (70.7)	
Others	5 (11.4)	39 (88.6)	
Average monthly salary (naira)			
≤200,000	33 (22.1)	116 (77.9)	0.466
201,000-400,000	26 (21.1)	97 (78.9)	
>400,000	3 (11.5)	23 (88.5)	
Number of years of experience			
<5	11 (25.6)	32 (74.4)	0.167
5-10	26 (25.2)	77 (74.8)	
>10	25 (16.4)	127 (83.6)	
BMI category (kg/m^2)			
<25	26 (31.0)	58 (69.0)	0.007*
≥25	36 (16.8)	178 (83.2)	
Profession			
Doctors	30 (21.1)	112 (78.9)	0.719
Nurses	28 (21.7)	101 (78.3)	
Others	4 (14.8)	23 (85.2)	

*P<0.01. BMI=Body mass index; PA=Physical activity; SD=Standard deviation

Table 4: Multivariate analysis of the factors associated with physical activity among the HCPs

Variable	Adjusted OR (95% CI)	*P*
Age (years)		
≤40	1	0.221
>40	1.50 (0.78-2.87)	
Marital status		
Single	1	0.309
Married/separated/widowed	1.45 (0.71-2.95)	
Ethnic group		
Yoruba	1	
Igbo	0.56 (0.30-1.06)	0.077
Others	1.92 (0.68-5.42)	0.219
BMI category (kg/m^2)		
<25	1	0.018*
≥25	2.10 (1.14-3.87)	

*Statistically significant. CI=Confidence interval; OR=Odd ratio; BMI=Body mass index; HCPs=Health care providers

(51.0%) had >10 years working experience, 133 (44.6%) were overweight, and 81 (27.2%) were obese.

Physical activity of the health care providers

Table 2 shows the PA levels of the HCPs. A low level of PA was typical for the HCPs (79.2%). The frequencies of moderate and high levels of PA were 29 (9.7%) and 33 (11.1%) respectively. Therefore, only 62 (20.8%) of the HCPs had adequate PA level i.e., met the recommended levels of PA.

The median (IQR) total MET weekly energy expenditure of the HCPs was 533.25 (255.75–1653.00) MET-min week-1. There was a significant difference in the median MET-min week-1 between the low, moderate or high PA levels ($P <$ 0.0001).

Walking was the most common form of PA undertaken by the HCPs. Majority (84%) of the HCPs had walked for at least 10 min at a time in the previous week. Only 24.7% and 35.3% respectively of the HCPs had participated in vigorous or moderate PA for at least 10 min in the previous week.

Tables 3 and 4 show the bivariate and multivariate analyses of the association of PA level with the socio-demographic characteristics and BMI ≥ 25 kg/m^2 among the HCPs. The factors that had a $P < 0.10$ were age group ($P = 0.056$), marital status ($P = 0.062$), ethnic group ($P = 0.045$), and BMI category ≥ 25 kg/m^2 ($P = 0.007$).

After adjusting for confounding variables, persons with a BMI of ≥ 25 kg/m^2 were twice more likely to have inadequate PA compared to those whose BMI was < 25 kg/m^2 ($P = 0.018$).

Discussion

To the best of our knowledge, this is one of the few studies that investigated PA using a standardized PA questionnaire among different cadres of HCPs in a tertiary institution in Nigeria. In this study, 20.8% HCPs met the recommended levels of PA, with the majority (79.2%) being physically inactive. Likewise, in a study on the lifestyle of doctors in Enugu, Nigeria, only 38.1% met the recommended PA level.[23]

The prevalence of physical inactivity among HCPs in this study was higher compared to studies on PA among Nigerian populations. Among rural dwellers of a community in South-West Nigeria, only 29.8% were physically inactive,[30] despite the older age (mean of 67 years) of the rural dwellers. Among urban dwellers of Maiduguri, a city in Northern Nigeria, only 31.4% were physically inactive.[9] These findings suggest that HCPs in Nigeria have lower levels of PA compared to the general population. Potential factors contributing to low levels of PA among HCPs compared to the general population include long working hours and sedentary nature of their work.

On the contrary, studies from other parts of the world suggest that HCPs have higher PA levels compared with the general population. Estonian family physicians,[15,19] Irish general practitioners,[14] US physicians and medical students,[18] US physical therapists, physical therapist assistants, and student physical therapists,[17] were all found to have higher PA levels compared with the general population.

In our study, physically inactive HCPs were 2 times more likely to be overweight compared to those who were physically active. Similar finding of the association between BMI category in the overweight or obese range and PA has been reported. Among medical personnel in Poland, physically inactive males were twice more likely to be overweight compared to those who were active.[31] In the study among doctors in Pakistan[32] and health workers of the Jos University Teaching Hospital, Nigeria,[33] physical inactivity was associated with BMI in the overweight and obese categories respectively.

We did not find an association between health professional group and PA [Table 3]. A study carried out in Croatia found nurses and physicians to be equally physically inactive.[34] On the other hand, among Polish medical personnel, doctors compared with nurses and other nonnursing professional categories were more likely to be physically inactive.[31]

Conclusion

The high rate of physical inactivity and overweight/obesity among this group of HCP in Nigeria puts them at risk of NCDs. This has public health implications. If the health workforce in Nigeria, which is still inadequate in numbers is unhealthy, this will limit the capacity to provide health related services to the people. The effectiveness of Nigerian HCPs as good role models, health promoters and health educators of PA is also in question. In this study, physical inactivity was associated with a BMI $\geq$ 25 mg/m^2. The high burden of overweight/obesity and physical inactivity among Nigerian HCPs is a thrust for further research. Furthermore, this call for an urgent need health promotion programs that will increase PA.

Limitations of the study

Due to the cross-sectional nature of our study, it was impossible to establish causality between PA and weight status.

Self-report of PA could lead to underestimation or overestimation of PA levels. We hope that the use of a standardized questionnaire that has been validated for use in Nigeria for assessment of PA will limit that.

In spite of these limitations, the study gives a useful glimpse of PA among HCPs who are meant to be role models of good health and behavior as well as health educators to the populace.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Global Recommendations on Physical Activity for Health. Geneva: World Health Organization; 2010. Available from: http://www.whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf. [Last accessed on 2014 Oct 12].
2. Schnohr P, Scharling H, Jensen JS. Changes in leisure-time physical activity and risk of death: An observational study of 7,000 men and women. Am J Epidemiol 2003;158:639-44.
3. Knight JA. Physical inactivity: Associated diseases and disorders. Ann Clin Lab Sci 2012;42:320-37.
4. Kohl HW 3rd, Craig CL, Lambert EV, Inoue S, Alkandari JR, Leetongin G, *et al.* The pandemic of physical inactivity: Global action for public health. Lancet 2012;380:294-305.
5. Guthold R, Louazani SA, Riley LM, Cowan MJ, Bovet P, Damasceno A, *et al.* Physical activity in 22 African countries: Results from the World Health Organization STEPwise approach to chronic disease risk factor surveillance. Am J Prev Med 2011;41:52-60.
6. World Health Organization. Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks. Geneva: World Health Organization; 2009. Available from: http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf. [Last accessed on 2014 Nov 19].
7. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U, *et al.* Global physical activity levels: Surveillance progress, pitfalls, and prospects. Lancet 2012;380:247-57.
8. Abubakari AR, Bhopal RS. Systematic review on the prevalence of diabetes, overweight/obesity and physical inactivity in Ghanaians and Nigerians. Public Health 2008;122:173-82.
9. Oyeyemi AL, Oyeyemi AY, Jidda ZA, Babagana F. Prevalence of physical activity among adults in a metropolitan Nigerian city: A cross-sectional study. J Epidemiol 2013;23:169-77.
10. Fie S, Norman IJ, While AE. The relationship between physicians' and nurses' personal physical activity habits and their health-promotion practice: A systematic review. Health Educ J 2013;72:102-19.
11. Lobelo F, Duperly J, Frank E. Physical activity habits of doctors and medical students influence their counselling practices. Br J Sports Med 2009;43:89-92.
12. Rogers LQ, Gutin B, Humphries MC, Lemmon CR, Waller JL, Baranowski T, *et al.* Evaluation of internal medicine residents as exercise role models and associations with self-reported counseling behavior, confidence, and perceived success. Teach Learn Med 2006;18:215-21.
13. Howe M, Leidel A, Krishnan SM, Weber A, Rubenfire M, Jackson EA. Patient-related diet and exercise counseling: Do providers' own lifestyle habits matter? Prev Cardiol 2010;13:180-5.
14. McGrady FP, McGlade KJ, Cupples ME, Tully MA, Hart N, Steele K. Questionnaire survey of PHysical activIty in General Practitioners (PHIT GP Study). Ulster Med J 2007;76:91-7.
15. Brotons C, Björkelund C, Bulc M, Ciurana R, Godycki-Cwirko M, Jurgova E, *et al.* Prevention and health promotion in clinical practice: The views of general practitioners in Europe. Prev Med 2005;40:595-601.
16. Frank E, Bhat Schelbert K, Elon L. Exercise counseling and personal exercise habits of US women physicians. J Am Med Womens Assoc 2003;58:178-84.
17. Chevan J, Haskvitz EM. Do as I do: Exercise habits of physical therapists, physical therapist assistants, and student physical therapists. Phys Ther 2010;90:726-34.
18. Stanford FC, Durkin MW, Blair SN, Powell CK, Poston MB, Stallworth JR. Determining levels of physical activity in attending physicians, resident and fellow physicians and medical students in the USA. Br J Sports Med 2012;46:360-4.

19. Suija K, Pechter U, Maaroos J, Kalda R, Rätsep A, Oona M, *et al.* Physical activity of Estonian family doctors and their counselling for a healthy lifestyle: A cross-sectional study. BMC Fam Pract 2010;11:48.
20. Stanford FC, Durkin MW, Stallworth JR, Blair SN. Comparison of physical activity levels in physicians and medical students with the general adult population of the United States. Phys Sportsmed 2013;41:86-92.
21. Gaertner PH, Firor WB, Edouard L. Physical inactivity among physicians. CMAJ 1991;144:1253-6.
22. Ordinioha B. The prevalence of hypertension and its modifiable risk factors among lecturers of a medical school in Port Harcourt, south-south Nigeria: Implications for control effort. Niger J Clin Pract 2013;16:1-4.
23. Aghaji MN. Doctors lifestyle in Enugu, Nigeria. East Afr Med J 2000;77:480-4.
24. Skaal L, Pengpid S. Physical activity, fitness level and health problems of healthcare workers in South Africa: The transtheoretical model as an explanatory framework. Afr J Phys Health Educ Recreation Dance 2011;17:612-23.
25. Kish L. A procedure for objective respondent selection within the household. J Am Stat Assoc 1949;44:380-7.
26. Isserlis L. On the value of a mean as calculated from a sample. J R Stat Soc 1918;81:75-81.
27. 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].
28. World Health Organisation. Global Recomendations on Physical Activity for Health. WHO; 2010. Available from: http://www.whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf. [Last accessed on 2013 Dec 13].
29. 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].
30. Ogunmola OJ, Olaifa AO, Oladapo OO, Babatunde OA. Prevalence of cardiovascular risk factors among adults without obvious cardiovascular disease in a rural community in Ekiti State, Southwest Nigeria. BMC Cardiovasc Disord 2013;13:89.
31. Biernat E, Poznanska A, Gajewski AK. Is physical activity of medical personnel a role model for their patients. Ann Agric Environ Med 2012;19:707-10.
32. Mahmood S, Najjad MK, Ali N, Yousuf N, Hamid Y. Predictors of obesity among post graduate trainee doctors working in a tertiary care hospital of public sector in Karachi, Pakistan. J Pak Med Assoc 2010;60:758-61.
33. Oyedeji A, Ogunleye OO, Ojomu F. Blood pressure and body mass index among Jos University Teaching Hospital Staff. Transnatl J Sci Technol 2013;3:67-82.
34. Kumbrija S, Milakovic SB, Jelinic JD, Matanic D, Markovic BB, Simunovic R. Health care professionals – Attitudes towards their own health. Acta Med Croatica 2007;61:105-10.