Assessment of physical activity among primary health care physicians in Tabuk region 2018; Frequency, determinants and barriers

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Abstract

Background: It has been reported that physicians tend to turn a blind eye to their own unfavorable lifestyle habits, and to be less proactive about providing patients with guidance for a better lifestyle if they are not practicing it themselves, and medical environment has a specific feature that discourages physical activity as a result of academic demands and work overload.

Objectives: To estimate the relation of physical activity practice with various socio-demographic data among primary health care physicians in Tabuk region in 2018, and to identify the main barriers of being physically active.

Methods: it's a Cross sectional design carried out in Tabuk region with 200 PHC doctors who are working in clinics were participated during the month of May 2018 using IPAQ.

Results and discussion: Low level of physical activity was reported by 45% of the physicians whereas moderate and high levels of physical activity were reported by 49% and 6% of them, respectively. physical
activity level was more reported among younger physicians compared to older physicians. Male physicians were more physically active than females. Non-smoker physicians were more physically active than smokers while obese physicians reported higher rates of moderate and high physical activities than normal and overweight subjects mostly due to their trials to lose weight. No association between chronic disease and physical activity.

The commonest barrier was who reported subjectively was giving priority to study and work than exercise, while the commonest benefits of practicing physical activities were knowing that exercise has positive impact on health.

Conclusion: a considerable proportion of primary healthcare physicians in Tabuk region had low level of physical activity. Younger, male, Saudi, family medicine residents, obese and non-smoker physicians were more physically active than their counterparts.

Keywords: Physical Activity, Primary Health Care, Physicians, Tabuk

Contents

List of tables

List of Figures

List of abbreviations

MET (metabolic equivalents of task)

PA (physical activity)

GPAQ (The Global Physical Activity Questionnaire)

AHA (The American Heart Association)

χ^2 (chi-square test)

SPSS (Statistical package for Social Sciences)

DHHS (US Department of Health and Human Services)

USA (United States of America)

CDC (Centers for Disease Control and Prevention)

OR (Odds ratio)

PHC (Primary health care)

BMI (Body mass index) MOH (Ministry of Health)

INTRODUCTION

Background:

Physical activity (PA) is a term represents a wide range of body movements that generated by the skeletal muscles and utilize energy above the baseline level. It includes routine daily activities, exercise, and active sports [(1)]. Exercise is an active repetitive form of physical activity that designed to improve the body fitness and health[(2)].

Physical activity, particularly exercise, enhances health and well-being through improving bone quality, strengthening muscles, increasing the capacity of cardiovascular system, and reducing depression and anxiety [(3)]. Scientific evidence has supported introducing of the exercise as the essential components of health promotion programs directed towards the general population[(1)].

Physicians, like the rest of the population, are not consistently meeting the recommended guidelines for physical activity. The American Heart Association (AHA) recommends “at least 150 minutes per week of moderate intensity aerobic activity or 75 minutes of vigorous activity for optimal health"[(4)].

It is well documented that the health of physicians directly affects the health of the larger population, as several studies have established an association between the health behaviors of physicians and their interactions with patients[(5)].

Physicians can have a favorable lifestyle not only for their own health but also in view of their role in providing guidance for patients. It has been reported that physicians tend to turn a blind eye to their own unfavorable lifestyle habits,

and to be less proactive about providing patients with guidance for a better lifestyle if they are not practicing it themselves[6].

Medical environment has a specific feature that discourages physical activity as a result of academic demands and work overload. It has been reported that weekly exercise among medical students decreased throughout medical training , most likely due to increased workloads and long hospital shifts during the clinical years[7].

Many studies addressed questions about the leisure activities of doctors, but consisted either of paeans to the need for doctors to relax and look after themselves more or to be more involved in leisure, or were descriptions of the leisure activities of particular doctors [8, 9].

A further set of articles assessed job and life satisfaction in doctors, and often but not always, reported dissatisfaction with time available for leisure activities [10-12], with sufficient time for leisure activities correlating with quality of life measures [13], and not having hobbies being a risk factor for hypertension in doctors [14].

Some studies also reported higher life satisfaction, including participation in hobbies and leisure activities, in retired doctors [15].

A few studies looked at leisure activities in relation to formal measures of stress or burnout, and reported that having a hobby correlated with higher levels of psychological well-being in general [16], with emotional exhaustion [17, 18] or with job stress [19].

Rationale of the study:

- Most of the researches about physicians' health has focused on work related stressors, depression and burnout, mental health status,

- job or life satisfaction and smoking. There was very little research estimating lifestyle habits and other preventive health measurement of physicians.
- Physical activity offers major health benefits and counseling for it should be integrated into the medical consultation.
- Based on the literature, the personal health behavior of the physician (including physical activity) is associated with his/her approach to counseling patients.
- There is no recent and accurate data about physical activity among health practitioners. So, recent study is deeply needed to update the figures and accurately measure the physical activity among primary health care physicians in Tabuk.

Aim of the study:

This study aimed at increasing the awareness regarding the importance of physical activity and exploring more methods for increasing physical activity among primary health care physicians.

Study objectives:

This study was carried out to

- Assess physical activity practice among primary health care physicians in Tabuk.
- To estimate the relation of physical activity practice with various socio-demographic data among primary health care physicians in Tabuk.
- To identify the main barriers of being physically active from the participants' prospective.

LITERATURE REVIEW

Despite the importance of assessing physical activities among physicians as they are acting as counselors to their patients regarding the importance of practicing physical

activities, relatively few studies have been conducted in this regards either locally or on international level. The following is a review of these studies and their main findings.

Studies carried out in Saudi Arabia:

In Aljouf Region of Saudi Arabia (2015), Bandayet al carried out a cross-sectional study to investigate physical activity profile among primary health care physicians of two cities (Sakaka and Dumat Al-Jandal). Moderate to vigorous physical exercise was reported by 65.2% of respondent whereas 34.8% of them were physically inactive with no significant difference was observed in physical activity between male and female physicians [20].

The same group of authors reported in another manuscript from the same study reported that 31.1% of physically inactive physicians have strong intention to increase their physical activity, and 68.9% were less confident to do so. Physically active physicians significantly imparted advice and role modeling on physical activity to their patients compared to physically inactive physicians, $p<0.01$[21].

In Riyadh, AL Reshidi adopted an analytical cross-sectional study to estimate the level of physical activity and the main barriers of being physically active among physicians at Prince Sultan Military Medical City. Slightly more than two-thirds (68.4%) of the participants had low level of physical activity (≤600-MET min/week). High physical activity level was more reported among male physicians compared to female physicians (4.3% versus 1.3%). Limited exercise facilities at home (71.7%),

not suitable weather (69%) and the first priority is not for exercise (67.2%) were the most frequent barriers of practicing physical activities among males whereas no enough time to exercise (69.3%), lack of suitable places to exercise nearby (68%), and the first priority is not for exercise (66.7%) were frequent barriers of practicing physical activities among females[22].

Another cross-sectional study was conducted in Riyadh by Mandil et al among physicians to identify the factors affecting physical inactivity. The prevalence of physical activity among physicians was 63%, which was higher than the general population (32.4%).

The main barrier for not practicing physical activity was lack of time (58.1%) followed by work duties (22.5%). No significant association between physical inactivity and major non-communicable diseases was observed[23].

Regional Studies:

In Bahrain, Bahram et al conducted a cross-sectional study to determine the prevalence of leisure-time physical activity habits among primary care physicians (MOH) as well as to determine predictors of engagement or not engagement in physical exercise among them. Physically active physicians represented 29.7 % of the studied sample.

Males were more physically active than females (44.3% versus 18.2%). Physical activity increases as age increases. Smokers were more active than non-smokers (55.6% versus 25.8%). The main reasons for engaging in physical activity were having fitness (31.3%), weight reduction (25.9%) and getting better health (14.3%). The main reasons for not engaging in physical activity were lack of time (42.4%), home and children demands (18.2%), work and duties responsibilities (15.2%) and lack of interest (7.9%)[28].

International Studies:

In Canada, Steen and Prebtani (2015) evaluated in a cross-sectional study the patterns of, and barriers to, of physical activity among resident and staff physicians in a teaching hospitals. The participant reported an average of 164 minutes per week of moderate to vigorous physical activity. There were no significant differences between resident and staff physicians, between men and women, among the various specialties, by number of children, or by exercise counselling practices. Within the age categories, those aged 35 to 44 years exercised significantly less than the group aged 45 to 54 years (110 vs. 231 minutes per week; P = 0.01). The most commonly cited barriers to physical activity included feeling too tired to exercise after work, the time required for exercise, family responsibilities, and unfavorable weather conditions[24].

In USA, Stanford et al carried out a cross-sectional study to specify if the amount of physical activity in physicians and medical students differs from the general adult population of the United States exists through a cross-sectional survey to determine their level of physical activity according to US Department of Health and Human Services (DHHS) 2008 guidelines. Data set was compared with physical activity data from the Centers for Disease Control and Prevention (CDC) The results revealed that only 64.5% of the general US adult population meets the US DHHS- 2008 guidelines for physical activity, but 78% of the physicians and medical students fulfilled the guidelines. The percentage of US adults who do not engage in leisure-time physical activity is 25.4% compared with 5.8% of physicians and medical students [(25)].

In Warsaw (Poland), Biernat et al (2012) carried out an interview study to estimate the prevalence of sports and physical activity of physicians, nurses and other medical personnel, who are in positions to provide physical activity counseling to patients. The prevalence in competitive sport was low but significantly higher among men, but there were no significant differences between genders in division for different professional groups.

Men more often took part in non-competitive leisure sport activities. A high level of physical activity was a rare characteristic for the majority of studied men and women (10.9 and 13.5%, respectively). A low level of physical activity was dominant among men and women (44.0 and 49.6% respectively). Independent risk factors of low physical activity were: not participating in sport or leisure sport activities (Odds ration “OR” 3.70and 2.08for men and women, respectively), being employed in an Out-patient Clinic (OR 2.86and 2.03 for men and women, respectively), overweight (only for men – OR 1.91), and working as a physician (OR 1.43)[(26)].

In USA, only 31% residents and fellows at Mayo clinic met the US Department of Health and Human Services recommendations for physical activity. Twenty three percent of the were enrolled in the exercise program with no significant differences were found between program participants and nonparticipants with regard to baseline demographic characteristics, medical training level and physical activity.

At study completion, program participants were more likely than nonparticipants to meet the Department of Health and Human Services recommendations for exercise (48% versus23%; P<.001)[27].

METHODOLOGY

Study design:

Cross sectional design.

Study area:

The study was carried out in Tabuk City, KSA which is located 2200 feet above sea level. It has a population of 890,922 (2016 census)[30].

In Tabuk, there are 92 primary health care centers belonging to Ministry of Health (MOH) and 6 main primary health care centers belonging to Ministry of Defense (Family medicine clinics in King Khalid military hospital, Main airbase family medicine center, Al-Razi family medicine center, Alsalamh family medicine center, Armor school family medicine center and Air defense family medicine center).

Study population:

Primary health care physicians working at primary health care centers in Tabuk province (MOH and military) both genders, all nationalities and job titles) constituted the target population of the study (n=396).

Inclusion and exclusion criteria:

The doctors who are not working in clinics (e.g. having administrative duties) were excluded.

Sample size

Assuming that the prevalence of physical inactivity among PHC physicians as 34.8%, based on another Saudi study carried out among PHC physicians in Aljouf[20], considering the margins of error as 5%, and at 95% confidence intervals, the minimum sample size was 186 using Roasoft online sample size calculator. This sample represents almost 47% of the total population. It was increased to 200 in order to compensate for possible drop out or incomplete response.

Sampling technique

Almost a quarter of the primary health care centers were randomly selected by simple random technique (23 belonging to MOH and two belonging to Ministry of Defense). All physicians in the selected PHC centers were invited to participate in the study by filling in the study questionnaire.

Data collection tool:

Self-administered questionnaire was used for data collection. It consisted of two parts: The first part contains questions about socio-demographic characteristics of the participants (age, gender, nationality, marital status, job title, smoking history, history of chronic diseases, weight and height). The second part inquired about participants` physical activity. The short form of the International Physical Activity Questionnaire (IPAQ) that provide common instrument to estimate the level of physical activity has been utilized in this regard[31].The IPAQ short version estimates how much health enhancing physical activity, including daily life activities and exercise, the person has undertaken over the previous 7 days. The questionnaires were distributed to all chosen primary health care physicians at their workplace. The reliability and validity of the questionnaire were tested across 12 countries (14 sites) in 2000[32].The findings suggested that it is an acceptable tool for use in many settings and in different languages, and is suitable for use in regional, national and international monitoring and surveillance system and for use in research projects and public health program planning and evaluation [33].

The IPAQ included questions about physical activity of three intensities (vigorous physical activity, moderate physical activity, and walking). The physicians estimated how many days (frequency) he/she was physically active and the average time (duration) that he/she spent being physically active on these days. The total physical activity was calculated as MET or metabolic equivalent (METmin/week), as suggested in the Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire for the sum of walking, and moderate, and vigorous physical activity[34]. IPAQ classified the subjects to three categorical levels, based on intensity, duration and the frequency of the physical activity [32].

The tool asks for times that individual spent in walking, moderate- and vigorous-intensity physical activities. The volume of activity was computed by weighting each type of activity by its energy requirements (METs).

METs are multiples of resting metabolic rate and a MET- minute is computed by multiplying the MET score of activity by the minutes performed [31].

Metabolic equivalent (MET) is a unit used to estimate the metabolic cost (oxygen consumption) of physical activity. One MET equals the resting metabolic rate of approximately 1 kcal/kg/h. MET-minutes is the rate of energy expenditure expressed as METs per minute multiplied by minutes of a specific activity[33].

Using the Ainsworth et al. compendium of the average MET score for each type of activity,[35] the following values were used for the analysis of IPAQ data: walking at work = 3.3 METs, cycling for transportation = 6.0 METs, moderate yard work = 4.0 METs and vigorous intensity in leisure = 8.0 METs[36].

The third part of the questionnaire inquires about barriers for being physically active (12 items) as well as reasons for being physically active (7 items). Respondents who subjectively have low physical activity were asked to mention the barriers for being physically active while those who subjectively have moderate or high physical activity were asked to mention the reasons for that. A 5-likert scale was used in this part of the questionnaire ranged between strongly agree “1” to strongly disagree”5”

Body mass index (BMI) was calculated and classified according to WHO criteria into:

- Underweight (BMI <15.8 kg/m^2)
- Normal (BMI 18.5–24.9 kg/ m^2)
- Overweight (BMI 25–29.9 kg/m^2)
- Obesity (BMI ≥ 30 kg/m^2)

Data collection technique:

The researcher distributed the self-administered questionnaire to the target population by direct contact with them.

Care was taken to not disturb the primary health care physicians` duty. The researcher was available to clarify any issue and the questionnaires were recollected soon after encounter.

The data were verified by hand then coded and entered to a personal computer. Thanks and appreciations were used to encourage the participants to be involved in the study.

Pilot study

The questionnaire was first tested in a pilot study group of 20 physicians, whose results were included in the final research as there was no significant difference from other study population. The aim of the pilot study was to test for the comprehensibility of the questionnaire as well as to estimate the time needed to fill in the questionnaire.

As a feedback, the questionnaire was comprehensive and clear and approximately 12 minutes were needed to fill it.

Data analysis:

The data were collected and verified by hand then coded before computerized data entry. The statistical Package for Social Sciences (SPSS) software version 25.0 was used for data entry and analysis. Descriptive statistics (e.g. frequency, percentage, mean, range, standard deviation) and analytic statistics using chi-square test (χ^2) were applied. P-values ≤ 0.05 was considered as statistically significant.

Administrative consideration:

The researcher fulfilled all the required official approvals prior to study conduction.

Ethical consideration:

Agreement to participate in the study as indicated in the first page of the questionnaire was considered as an informed consent. All participants had the right not to participate in the study or to withdraw from it prior to completion. The researcher explained the purpose to all respondents. Confidentiality and privacy were guaranteed for all participants throughout all steps of the research.

Budget:

This study was carried out at the full expense of the researcher.

RESULTS

Two hundreds primary health care physicians were enrolled in the study. Males represent 67% of them. Their age ranged between 26 and 55 years with a mean±SD of 37.5±8.2 years. Most of them (80%) were non-Saudis. Almost two-thirds of them (62%) were married. Three-quarters of the physicians were general practitioners (GPs) whereas 17% were family medicine residents. Table 1

The prevalence of current smoking was 40% whereas that of ex-smoking was 2% as illustrated in figure 1. Among current smokers, cigarettes (72.5%) and Shisha (25%) were commonest forms of smoking. Figure 2

History of chronic diseases was reported by 13% of the physicians as shown in figure 3. The commonest reported diseases were hypertension (12%) and Diabetes mellitus (8%). Figure 4

The prevalence of overweight and obesity among the participants were 46% and 11%, respectively whereas that of underweight was only 1%. Figure 5

Table 1: Personal characteristics of primary healthcare physicians, Tabuk

	Frequency	**Percentage**
Gender		
Male	**134**	**67.0**
Female	**66**	**33.0**
Age (years)		
≤30	**44**	**22.0**
31-40	**88**	**44.0**
41-50	**50**	**25.0**
>50	**16**	**8.0**
Range	**26-55**	
Mean±SD	**37.5±8.2**	

Nationality		
Saudi	**40**	**20.0**
Non-Saudi	**160**	**80.0**
Marital status		
Single	**76**	**38.0**
Married	**124**	**62.0**
Job title		
General practitioner	**150**	**75.0**
Family Medicine resident	**34**	**17.0**
Family Medicine specialist	**10**	**5.0**
Family Medicine consultant	**6**	**3.0**

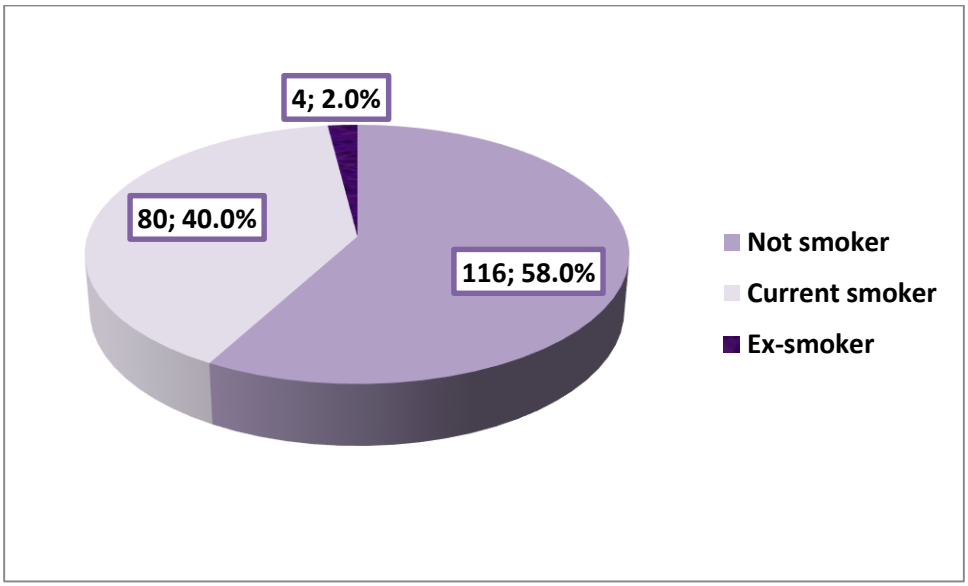


Figure 1: Smoking history among primary healthcare physicians, Tabuk

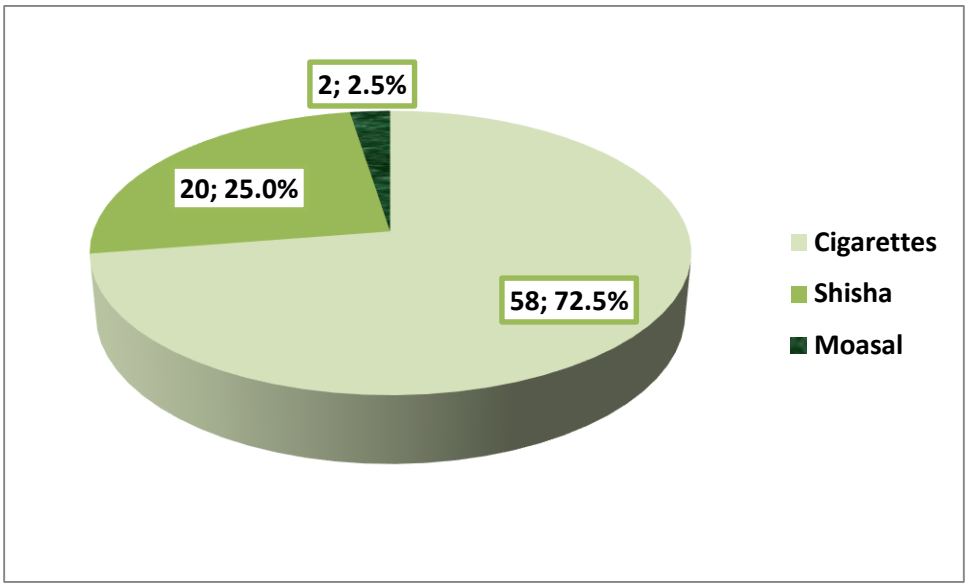


Figure 2: Type of smoking among current smoking physicians (n=80)

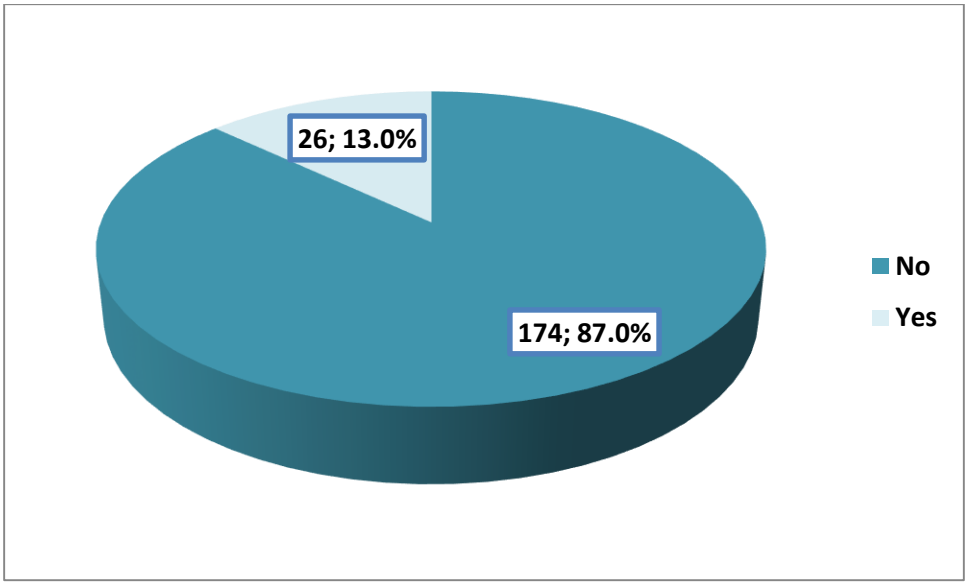


Figure 3: History of chronic diseases among primary healthcare physicians, Tabuk.

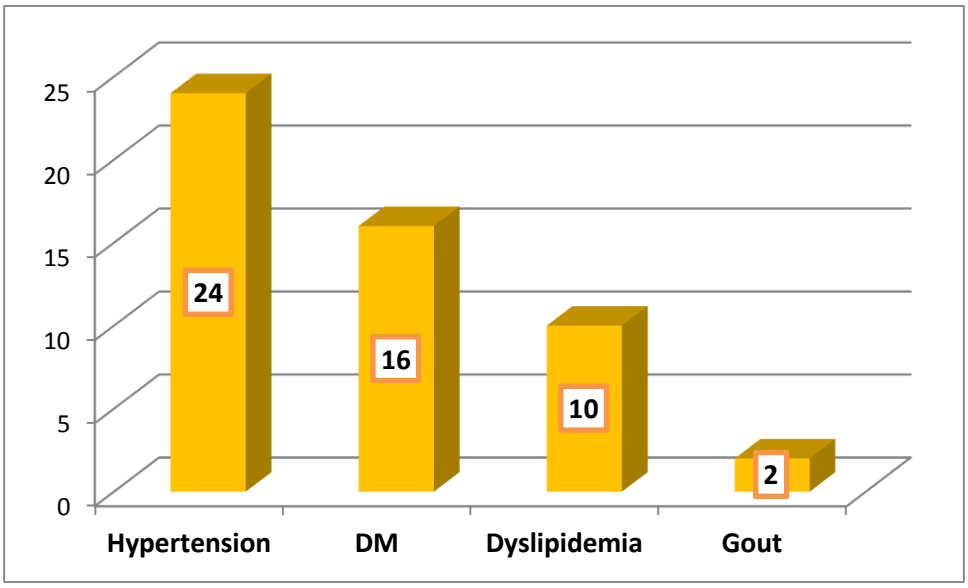


Figure 4: Prevalence of different chronic diseases among primary healthcare physicians, Tabuk.

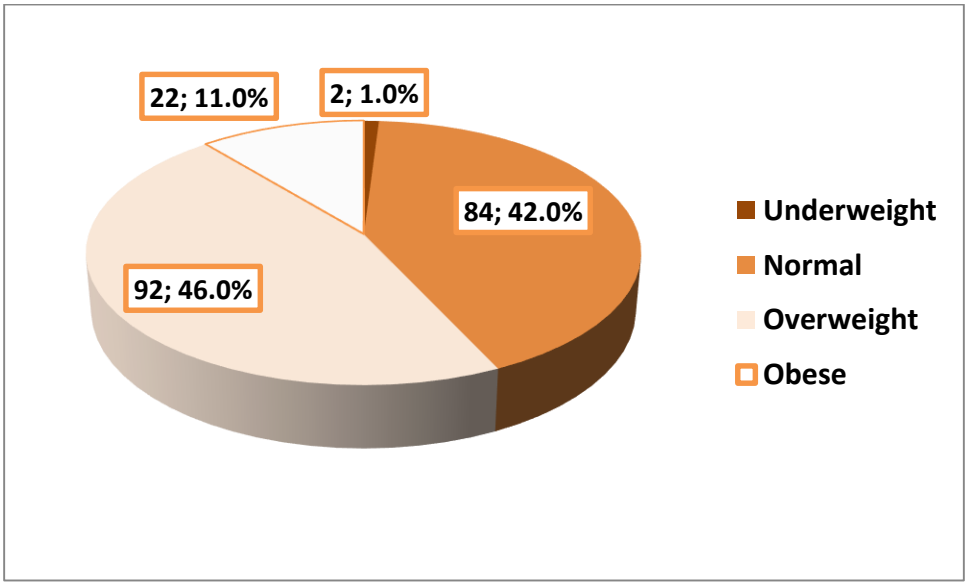


Figure 5: Body mass index of the primary healthcare physicians, Tabuk.

Level of physical activity

Low level of physical activity (≤600 MET min/week) was reported by 45% of the physicians whereas moderate level (601-3000 MET min/week) was reported by almost half of them (49%). High level of physical activity (≥3001 MET min/week) was reported by only 6 physicians (6%). Figure 6

Regarding type of physical activities, vigorous type was practiced by 22% of the primary healthcare physicians whereas moderate type was practiced by 46% of them. Walking was reported by 75% of the physicians. Figure 7

Regarding duration of sitting (minutes/day), figure 8 shows that majority of physicians (96%) reported sitting period more than 360 minutes/day.

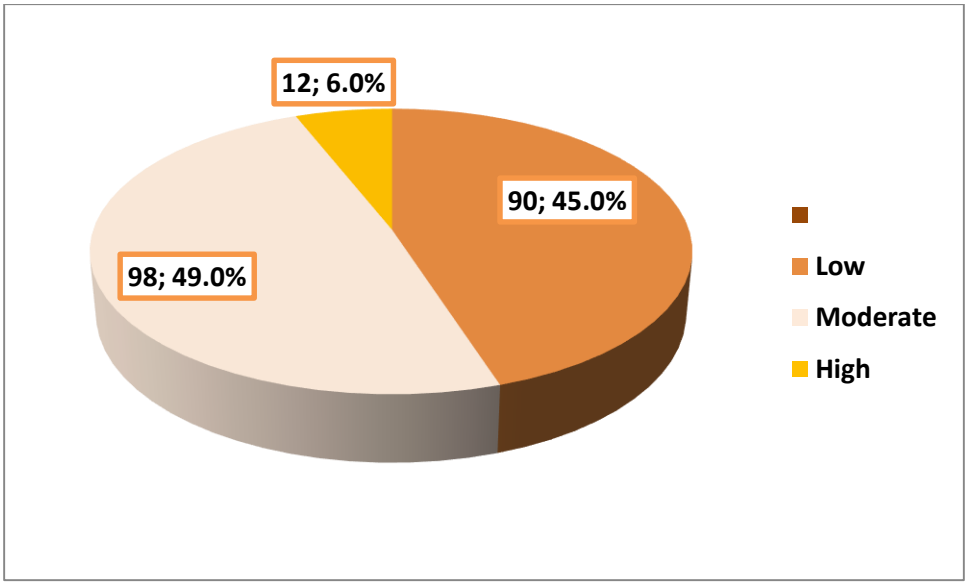


Figure 6: Level of physical activity among primary healthcare physicians, Tabuk

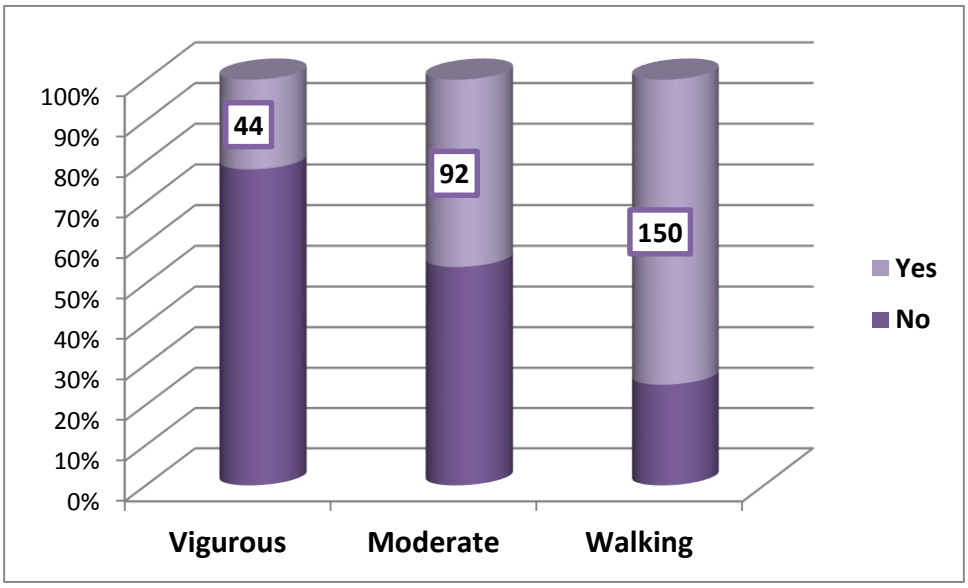


Figure 7: Types of physical activities practiced by primary healthcare physicians, Tabuk

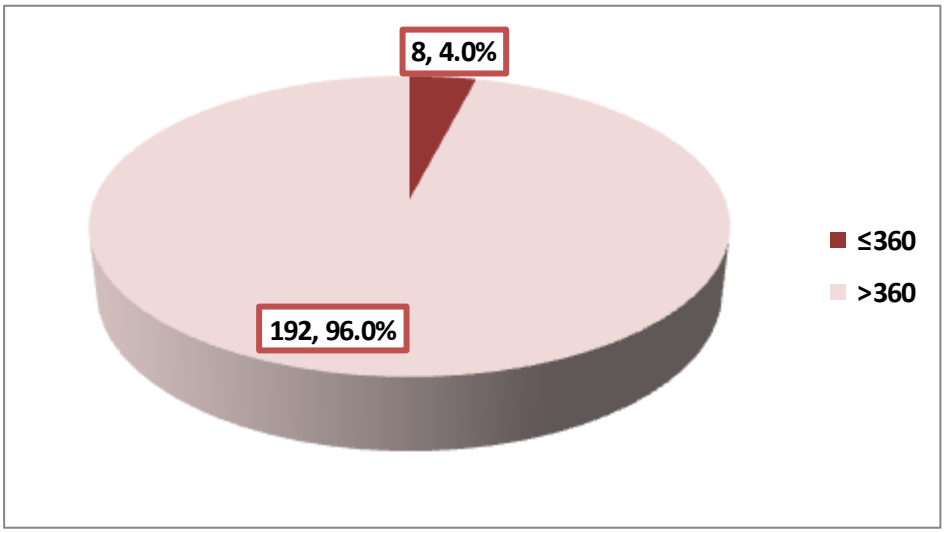


Figure 8: Duration of sitting in minutes/day among primary healthcare physicians, Tabuk

Factors associated with physical activity:

Gender: High and moderate physical activities were more practiced by male compared to female physicians (7.5% and 55.2% versus 3.0% and 36.4%, respectively. This difference was statistically significant, p=0.007. Table 2

Table 2: Association between gender and physical activity among primary healthcare physicians, Tabuk

Gender	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
Male (n=134)	50 (37.3)	74 (55.2)	10 (7.5)	0.007
Female (n=66)	40 (60.6)	24 (36.4)	2 (3.0)	

*Chi-square test

Age: High physical activity level was more reported among physicians aged 40 years or below compared to older physicians (9.1% versus zero). Also moderate level of physical activity was more observed among younger physicians "≤30 years" (72.7%) than those aged over 50 years (12.5%). The difference was statistically significant, p<0.001. Table 3

Table 3: Association between age and physical activity among primary healthcare physicians, Tabuk

Age (years)	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
≤30(n=44)	8 (18.2)	32 (72.7)	4 (9.1)	<0.001
31-40 (n=88)	22 (25.0)	58 (65.9)	8 (9.1)	
41-50 (n=50)	46 (88.5)	6 (11.5)	0 (0.0)	
>50 (n=16)	14 (87.5)	2 (12.5)	0 (0.0)	

*Chi-square test

Nationality: As realized from table 4, moderate and high physical activities were more practiced by Saudi than non-Saudi physicians (70% and 15% versus 43.8% and 3.8%, respectively), p<0.001.

Table 4: Association between nationality and physical activity among primary healthcare physicians, Tabuk

Nationality	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
Saudi (n=40)	6 (15.0)	28 (70.0)	6 (15.0)	<0.001
Non-Saudi (n=160)	84 (25.4)	70 (43.8)	6 (3.8)	

*Chi-square test

Marital status: As realized from table 4, there was no statistically significant association between marital status of patients and level of physical activity.

Table 5: Association between marital status and physical activity among primary healthcare physicians, Tabuk

Marital status	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
Single (n=76)	32 (42.1)	36 (47.4)	8 (10.5)	0.106
Married (n=124)	58 (48.8)	62 (50.0)	4 (3.2)	

*Chi-square test

Job title: It is shown in table 6, that the highest rates of moderate and high physical activity was observed among family medicine residents (64.7% and 23.5%, respectively) whereas high physical activity was nor reported among any of family medicine specialists and consultants. The association between job title and level of physical activity was statistically significant, p<0.001.

Table 6: Association between job title and physical activity among primary healthcare physicians, Tabuk

Job title	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
General practitioner (n=150)	80 (53.3)	66 (44.0)	4 (2.7)	<0.001
Family Medicine resident (n=34)	4 (11.8)	22 (64.7)	8 (23.5)	
Family Medicine specialist (n=10)	6 (60.0)	4 (40.0)	0 (0.0)	
Family Medicine consultant (n=6)	0 (0.0)	6 (100)	0 (0.0)	

*Chi-square test

Body mass index: It is evident from table 7, that majority of obese physicians (81.8%) and two-thirds (66.7%) of normal subjects practiced moderate physical activities compared to 23.9% of overweight physicians. Also high level of physical activity was practiced by 9.1% of obese physicians and 7.1% of normal subjects compared to none of underweight and 4.3% of overweight subjects. Overall, the association between BMI of the physicians and level of practiced physical activity was statistically significant, p<0.001.

Table 7: Association between body mass index and physical activity among primary healthcare physicians, Tabuk

Body mass index	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
Underweight (n=2)	0 (0.0)	2 (100)	0 (0.0)	<0.001
Normal (n=84)	22 (26.2)	56 (66.7)	6 (7.1)	
Overweight (n=92)	66 (71.8)	22 (23.9)	4 (4.3)	
Obesity (n=22)	2 (9.1)	18 (81.8)	2 (9.1)	

*Chi-square test

History of chronic diseases: It is shown from table 8, that there was no statistically significant association between history of chronic diseases of physicians and level of physical activity.

Table 8: Association between history of chronic diseases and physical activity among primary healthcare physicians, Tabuk

History of chronic diseases	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
No (n=174)	78 (44.8)	84 (48.3)	12 (6.9)	0.378
Yes(n=26)	12 (46.2)	14 (53.8)	0 (0.0)	

*Chi-square test

History of smoking: Table 9 shows that most of non-smokers (60.3%) practiced moderate physical activity compared to 32.5% of current smokers whereas 62.5% compared to 34.5% of current and non-smokers, respectively practiced low level of physical activity, p<0.001.

Table 9: Association between history of smoking and physical activity among primary healthcare physicians, Tabuk

History of smoking	Level of physical activity			p-value*
	Low N=90 N (%)	Moderate N=98 N (%)	High N=12 N (%)	
Not smoker (n=116)	40 (34.5)	70 (60.3)	6 (5.2)	<0.001
Current smoker (n=80)	50 (62.5)	26 (32.5)	4 (5.0)	
Ex-smoker (n=4)	0 (0.0)	2 (50.0)	2 (50.0)	

*Chi-square test

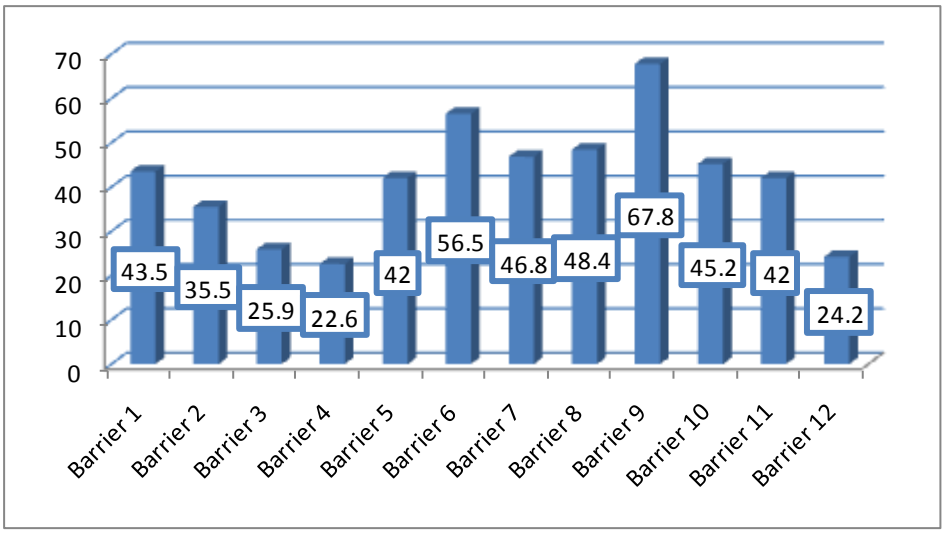
Barriers of practicing physical activities:

As evident from table 10 and figure 9, the commonest barrier of practicing physical activities as reported by the participated physicians who reported subjective physical inactivity was giving priority to study and work than exercise (67.8%),

followed by too few suitable places to exercise in their region (56.5%), absence of encouragement to exercise by family and friends (48.4%), having no exercise facilities at home (46.8%) and having no enough time to exercise because of academic curriculum and work (45.2%).

Table 10: Barriers for physical activity among subjective physically inactive primary healthcare physicians (n=124).

	Statement	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
1	Exercise is hard work I am fatigued by it	10 (16.1)	17 (27.4)	15 (24.2)	19 (30.6)	1 (1.6)
2	I have no sufficient energy for exercise because of health problems	5 (8.1)	17 (27.4)	17 (27.4)	15 24.2)	8 (12.9)
3	I have other recreational activities to do with friends	4 (6.5)	12 (19.4)	32 (51.6)	11 (17.7)	3 (4.8)
4	I am too embarrassed to exercise	6 (9.7)	8 (12.9)	28 (45.2)	11 (17.7)	9 (14.5)
5	I'm not sure of my ability to exercise efficiently	4 (6.5)	22 (35.5)	19 (30.6)	15 (24.2)	2 (3.2)
6	There are too few suitable places to exercise in my region	13 (21.0)	22 (35.5)	21 (33.9)	5 (8.1)	1 (1.6)
7	I have no exercise facilities at home	13 (21.0)	16 (25.8)	20 (32.3)	11 (17.7)	2 (3.2)
8	My family and friends do not encourage exercising	13 21.0)	17 (27.4)	21 (33.9)	6 (9.7)	5 (8.1)
9	I am giving priority to study and work than exercise	14 (22.6)	28 (45.2)	15 (24.2)	4 (6.5)	1 (1.6)
10	I have no enough time to exercise because of my academic curriculum and work	6 (9.7)	22 (35.5)	24 (38.7)	10 (16.1)	0 (0.0)
11	I have no enough time to exercise because of my family and social relationships	6 (9.7)	20 (32.3)	19 (30.6)	12 (19.4)	5 (8.1)
12	It costs too much money to exercise	2 (3.2)	13 (21.0)	14 (22.6)	15 (24.2)	18 (29.0)



1. Exercise is hard work I am fatigued by it
2. I have no sufficient energy for exercise because of health problems
3. I have other recreational activities to do with friends
4. I am too embarrassed to exercise
5. I `m not sure of my ability to exercise efficiently
6. There are too few suitable places to exercise in my region
7. I have no exercise facilities at home
8. My family and friends do not encourage exercising
9. I am giving priority to study and work than exercise
10. I have no enough time to exercise because of my academic curriculum and work
11. I have no enough time to exercise because of my family and social relationships
12. It costs too much money to exercise

Figure 9: Barriers for physical activity among subjective physically inactive primary healthcare physicians (n=124)

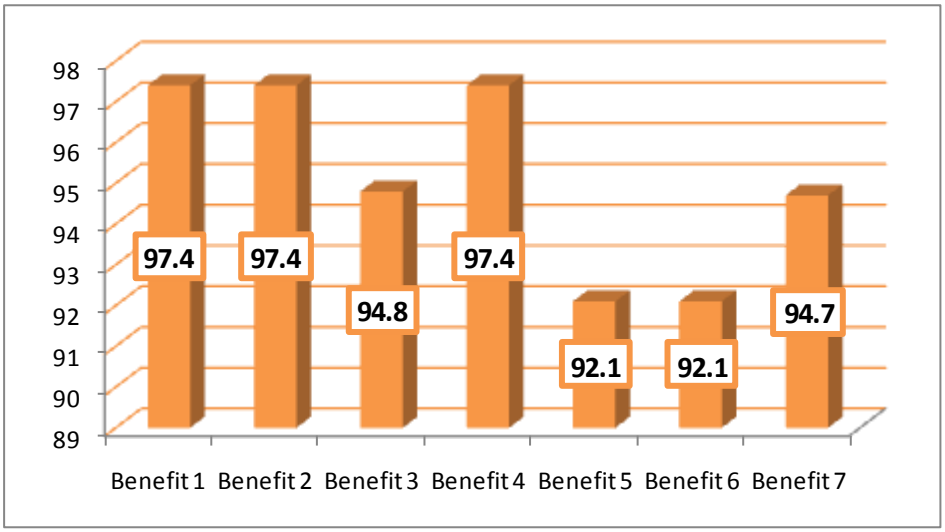
Benefits of practicing physical activities:

Table 11 and figure 10 show that the commonest benefits of practicing physical activities as reported by the participated physicians who reported subjective physical activity were knowing that exercise has positive impact on health, feeling more energized that

exercise helped them to study and work and burn more calories to compensate calories gained from social occasions (97.4%), followed by improvement overall appearance (94.8%), and being an ideal model for patients (94.7%).

Table 11: Benefits for physical activity among subjective physically active primary healthcare physicians (n=76).

	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
I know that exercise has positive impact on health	26 (68.5)	11 (28.9)	1 (2.6)	0 (0.0)	0 (0.0)
Feel more energized that helps me to study and work	16 (42.1)	21 (55.3)	1 (2.6)	0 (0.0)	0 (0.0)
Improve overall appearance	18 (47.4)	18 (47.4)	2 (5.2)	0 (0.0)	0 (0.0)
Burn more calories to compensate calories gained from social occasions	18 (47.4)	19 (50.0)	1 (2.6)	0 (0.0)	0 (0.0)
Be able to withstand stress	16 (42.1)	19 (50.0)	3 (7.9)	0 (0.0)	0 (0.0)
Keep focused	20 (52.6)	15 (39.5)	3 (7.9)	0 (0.0)	0 (0.0)
To be an ideal model for my patients	29 (76.3)	7 (18.4)	2 (5.3)	0 (0.0)	0 (0.0)



1. I know that exercise has positive impact on health
2. Feel more energized that helps me to study and work
3. Improve overall appearance
4. Burn more calories to compensate calories gained from social occasions
5. Be able to withstand stress
6. Keep focused
7. To be an ideal model for my patients

Figure 10: Benefits for physical activity among subjective physically active primary healthcare physicians (n=76).

DISCUSSION

Primary healthcare physicians as a model for their patients should be physically active as well as it has been documented that physically active physicians are more likely to be engaged in counseling on physical activity more often than physically inactive physicians [(20)]. Assessment of such activities is essential in our Region as far as we know; no study was done to assess physical activity among primary healthcare physicians in Tabuk. Therefore, this study was carried out to investigate this important issue and its socio-demographic determinants as well as to identify barriers and befits of physical activity among PHC physicians.

The decline in physical activity among general population, including physicians and its detrimental effects on public health has been well recognized as an alarming worldwide problem [(37)]. In the current study, moderate physical activities were reported by 46% of the physicians whereas vigorous activities were mentioned by 22% of them. In a similar Saudi study carried out by Banday et al at two cities (Sakaka and Dumat Al-Jandal) in Aljouf Region, moderate to vigorous physical exercise was reported by 65.2% of respondents [(20)], which is very close to our findings.

Low level of physical activity (≤600 MET min/week) was reported by 45% of the physicians in the present study whereas moderate (601-3000 MET min/week) and high levels (≥3001 MET min/week) of physical activity were reported by 49% and 6% of them,

respectively. In Riyadh,[22], AL Reshidi reported that 68.4% of the physicians at Prince Sultan Military Medical City had low level of physical activity whereas 28.4% and 3.2% of them had moderate and high physical activity levels, respectively. In another study conducted in Riyadh by Mandil et al among physicians, the prevalence of physical activity was 63% [23].

Concerning Gulf countries, in Bahrain, physically active physicians represented 29.7 % of the studied group[28]. In Egypt, 84% of physicians at Ain Shams University, Cairo were sedentary with no or irregular physical activity [38].

Internationally, in Canada, a study carried out by Steen and Prebtani (2015) among resident and staff physicians in a teaching hospitals revealed that the physicians had an average of 164 minutes per week of moderate to vigorous physical activity [24]. In Argentina (2014), Lobo et al reported that physical activity levels among physicians were low, moderate or vigorous among 37.5%, 57.5%, and 5% of physicians, respectively [29]. In USA (2013), Stanford et al carried out a study to compare physical activity in physicians and medical students with that of the general adult population according to US Department of Health and Human Services (DHHS) 2008 guidelines. The results revealed that 64.5% of the general US adult population meets the US Department of Health and Human Services (DHHS) 2008 guidelines for physical activity compared to 78% of the physicians and medical students. The percentage of US adults who do not engage in leisure-time physical activity is 25.4% compared with 5.8% of physicians and medical students [25]. In a study carried out in Warsaw (Poland) by Biernat et al (2012) among physicians, nurses and other medical personnel, the prevalence of sport was low and the high level of physical activity was a rare characteristic for the majority of studied men and women. A low level of physical activity was dominant among men and women (44.0 and 49.6% respectively) [26]. In Estonia, 92% of female family physicians were physically active [39]. These various rates between different studies could be attributed to different cultures, demographic characteristics of physicians and tools used to assess physical activity.

In the present study, high physical activity level was more reported among physicians aged 40 years or below compared to older physicians. Also moderate level of physical activity was more observed among younger physicians "≤30 years" (72.7%) than those aged over 50 years (12.5%). In a study carried out in Canada (2015),

physicians aged 35 to 44 years exercised significantly less than the group aged 45 to 54 years (110 vs. 231 minutes per week; P = 0.01) [24]. Also in Bahrain, physical activity increases as age increases [28]. Therefore, older physicians in our culture should be encouraged to be more physically active as they are more prone to be affected by diseases caused by physical inactivity.

The finding that family medicine residents and Saudi physicians were more physically active than others in the current study is mostly attributed to their younger age. In Estonia, among family medicine physicians, no relation was reported between age and physical activity [39].

In the present study, male physicians were more physically active than females. In Aljouf Region [20], there was no significant difference in physical activity between male and female physicians [20]. Similarly, in Canada, there were no significant differences between male and female physicians [24]. However, in Riyadh and in accordance with our finding, male physicians were more significantly physically active than females as 4.3% of them versus 1.3% of females practiced vigorous activities [22]. Also, in Bahrain, males were more physically active than females (44.3% versus 18.2%) [28]. Similarly, in Poland, men medical staff members were more physically active than females [26]. We think that in the near future, women will play more active role in the community and consequently became more physically active as since few years, the Saudi government issued a legislation to empower women to play their role in the development of the country [40].

In the present study, non-smoker physicians were more physically active than smokers. This finding contradicts that has been reported by Bahram in Bahrain as smokers were more active than non-smokers (55.6% versus 25.8%)[28]. However, in Estonia, smoking was not related to physical activity among family medicine physicians [39].

In the current study, obese physicians reported higher rates of moderate and high physical activities than normal and overweight subjects mostly due to their trials to lose weight. In Poland, overweight male physicians were less physically active than other categories of BMI [26]. However, no association between BMI and physical activity was observed among family medicine physicians in a study carried out in Estonia [39].

In accordance with Mandil et al.[23] history of chronic diseases was not significantly associated with level of physical activity in the present study.

In the current study, the commonest barrier of practicing physical activities as reported by the participated physicians who reported subjective physical inactivity was giving priority to study and work than exercise (67.8%), followed by too few suitable places to exercise in their region (56.5%), absence of encouragement to exercise by family and friends (48.4%), having no exercise facilities at home (46.8%) and having no enough time to exercise because of academic curriculum and work (45.2%). Different results were observed in various studies carried out in Saudi Arabia or outside it. AL Reshidi in his study included physicians at residency training program at Prince Sultan Military Medical City in Riyadh reported that limited exercise facilities at home (71.7%), not suitable weather (69%) and the first priority is not for exercise (67.2%) were the most frequent barriers of practicing physical activities among males whereas no enough time to exercise (69.3%), lack of suitable places to exercise nearby (68%), and the first priority is not for exercise (66.7%) were frequent barriers of practicing physical activities among females[22]. In another study conducted in Riyadh by Mandil et al among physicians, the main barrier for not practicing physical activity was lack of time (58.1%) followed by work duties (22.5%) [23]. In Bahrain, the main reasons for not engaging in physical activity were lack of time (42.4%), home and children demands (18.2%), work and duties responsibilities (15.2%) and lack of interest (7.9%)[28]. In Canada, the most commonly cited barriers to physical activity included feeling too tired to exercise after work, the time required for exercise, family responsibilities, and unfavorable weather conditions[24].

A study carried out in Argentina (2014) revealed that the main reason for not performing exercise was lack of time. Men performed more vigorous physical activity than women (20 versus 15%)[29].

In this study, the commonest benefits of practicing physical activities as reported by the participated physicians who reported subjective physical activity were knowing that exercise has positive impact on health, feeling more energized that exercise helped them to study and work and burn more calories to compensate calories gained from social occasions (97.4%), followed by improvement overall appearance (94.8%),
And being an ideal model for patients (94.7%). In a similar study carried out in Bahrain (2003), the main reasons for engaging in physical activity were having fitness (31.3%), weight reduction (25.9%) and getting better health (14.3%) [28].

The study also has some limitations, one being limitation is the possible risk of overestimation or underestimation where physical activity is self-reported. The self-reported total physical activity scores alone do not yield a complete pattern of physical activity. On the other hand, the questionnaire is the most widely used method in epidemiological studies, while laboratory methods are more expensive and mainly done for validation purposes. [41]. Hence it is evident that validated self-reported questionnaires like the IPAQ are suitable for everyday practice [42]. The cross-sectional design of the survey makes it difficult to look for the causal relationships among studied variables. Finally, subjects included in the study represented primary healthcare physicians in Tabuk, thus the findings cannot be generalized beyond those in other areas in KSA. Despite these limitations, findings from this study could have great implications for public health policies.

CONCLUSION

In conclusion, a considerable proportion of primary healthcare physicians in Tabuk city had low level of physical activity. Younger, male, Saudi, family medicine residents, obese and non-smoker physicians were more physically active than their counterparts.

The commonest barrier of practicing physical activities was giving priority to study and work than exercise, followed by too few suitable places to exercise in their region, absence of encouragement to exercise by family and friends, having no exercise facilities at home and having no enough time to exercise because of academic curriculum and work. Overcoming these barriers may contribute to a further increase in the level of physical activity among them.

The commonest benefits of practicing physical activities were knowing that exercise has positive impact on health, feeling more energized that exercise helped them to study and work and burn more calories to compensate calories gained from social occasions , improvement overall appearance and being an ideal model for patients.

RECOMMENDATIONS

According to the study findings, the following are recommended:

1. Continue and intensify actions to promote various forms of physical activity among primary healthcare physicians in Tabuk.
2. Attempts should be done to minimize barriers raised by primary healthcare physicians to be physical activity, particularly among older, female, overweight and smoker physicians.
3. Providing suitable places for primary healthcare physicians, particularly females to practice physical exercise inside or near the health care settings.
4. Finally, further study is recommended including physicians from other healthcare categories to have a more comprehensive picture of the problem in Tabuk.

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Annex 1:

The questionnaire

Annex 2:

Brief CV of Researcher

بسم الله الرحمن الرحيم

Dear colleague, I will appreciate your valuable participation in my research titled:

Assessment of physical activity among primary health care physicians in Tabuk 2018: Frequency, determinants and barriers

The objective of this study is to determine the level of physical activity, the main barriers of being physically active among primary health care physicians in Tabuk

Kindly fill this questionnaire, all the information will be kept confidential and will be used for the research purpose only.

Thanks for your help and for your valuable time

Researcher

Dr Mansour Ahmed Alanazi

Family Medicine Resident

	Part 1. Personal characteristics
1	Gender : 1.___ Male 2.___Female
2	Age : ……. years
3	Nationality: 1___ Saudi 2___Non-Saudi
4	Marital status: 1___ Single 2___Married 3___ Divorced 2___Widowed
5	Job title 1___ Generalpractitioner 2____ Family Medicine resident 3 ___Family Medicine specialist 4____ Family Medicine consultant 3 ___Others……..

6	Smoking : 1___Not smoker 2___ Current smoker 3___ex-smoker If smoker, specify 1___Cigarette 2___ Shisha 3___Moasal
7	Chronic health problems: 1___ No 2___Yes (specify……..)
8	BMI : 1___Weight…….kg 2___ Height……cm 3___BMI……..kg/m^2

ID:……

Part 2: Reasons for being physically active.

If you consider yourself as physically active. Please mark the response that describes your opinion for each of the following statements that describe different reasons for being physical activity.

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
I know that exercise has positive impact on health					
Feel more energized that helps me to study and work					
Improve overall appearance					
Burn more calories to compensate calories gained from social occasions					
Be able to withstand stress					
Keep focused					
To be an ideal model for my patients					
Others Specify.....					

Part 3: Barriers for physical activity

If you consider yourself as physically inactive. Please mark the response that describes your opinion for each of the following statements that describe different barriers for having regular physical activity.

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Exercise is hard work I am fatigued by it					
2	I have no sufficient energy for exercise because of health problems					
3	I have other recreational activities to do with friends					
4	I am too embarrassed to exercise					
5	I`m not sure of my ability to exercise efficiently					
6	There are too few suitable places to exercise in my region					
7	I have no exercise facilities at home					
8	My family and friends do not encourage exercising					
9	I am giving priority to study and work than exercise					
10	I have no enough time to exercise because of my academic curriculum and work					
11	I have no enough time to exercise because of my family and social relationships					
12	It costs too much money to exercise					
13			**Others.....**			

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ **days per week**

   ☐ No vigorous physical activities → ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   _____ **hours per day**

   _____ **minutes per day**

   ☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   _____ **days per week**

   ☐ No moderate physical activities → ***Skip to question 5***

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐ No walking → ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

This is the end of the questionnaire, thank you for participating.