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RESEARCH ARTICLE

PERIODIC HEALTH EXAMINATION, KNOWLEDGE AND ITS DETERMINANTS AMONG MALE SECONDARY SCHOOL TEACHERS IN THE WESTERN SECTOR AT MAKKAH CITY, 2019, A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: To evaluate the level of knowledge of periodic health examination among teachers and, therefore, to assess the need to increase the knowledge of and training on PHE. **Method:** Cross-sectional, analytical study. Conducted throughout September 2019. The study involved 18 secondary schools, selected randomly from the 10 different educational sectors, in Makkah al-Mukarrama. Our total participants were 214 male teachers. **Results:** More than half of the participants (55.7%) had "weak" knowledge of PHE, 41.4%of the participants had no knowledge of PHE, and only 3.0% had average knowledge**. Conclusion:** More effort is needed to ensure that periodic health examination is practiced. There is a need to study the factors associated with the uptake of periodic health examination (PHE) among the study population**.**

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INTRODUCTION

Periodic health examination (PHE) is a group of tasks designed to determine the risk of disease or identify disease in its early, symptomless state (Canadian Medical Association, 1979). Although PHE is free of charge at the Ministry of Health (MOH) facilities, few Saudis seek preventive healthcare, and most healthcare visits are for symptomatic encounters. The KSA could reduce its health expenditure by ensuring high coverage of at-risk populations, using PHE to detect chronic conditions at the early stages (El Bcheraoui *et al*., 2015). Some countries, such as the United Kingdom and Germany, encourage PHEs for otherwise healthy adults aged 40–75 years, arguing that this group have an increasing burden of lifestyle and chronic diseases that may be amenable to intervention. In Canada, however, the ongoing variability in practice, with a trend toward reducing or eliminating PHEs of adults, may be confusing to patients (Romm, 1981). Saudi still faces major preventable health challenges (Si *et al*., 2014). Periodic health examination (PHE) could be a normal wellbeing check program for sound individuals who have not, however, demonstrated symptoms of a disease.

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The reason for PHE is to assess wellbeing, screen for risk components and maladies, and give preventive counseling mediations in an age-appropriate manner (Ilesanmi, 2015). The originof PHE dates back to at least the Industrial Revolution when employers paid for annual check-ups to keep their labor force healthy. Nowadays, the practice is subsumed into the roleof primary care doctors. It is alluded to by distinctive terms (e.g. annual health examination, periodic health visit) and is notan insured service in all provinces (Allison *et al*., 2015). PHE is an opportunity to perform evidence-based preventive measures, to counsel patients on lifestyle issues, update vaccinations, and, importantly, to identify risk factors and diagnosis through updating the cumulative patient profile (i.e. patient history) (Sarah Larkins, 2013). The objective of periodic health examination (PHE) is to prevent the onset of disease or the compounding of an existing ailment, for example, measurement of blood pressure is intended to detect hypertension in order to initiate treatment and prevent subsequent morbidity (e.g. stroke or renal failure) or mortality. Preventive medical practice servesas a superior strategy to decrease mortality and morbidity of diverse illnesses in communities (Duerksen, 2012). In the Kingdom of Saudi Arabia (KSA), free healthcare is offered to Saudi citizens (Almalki, 2011). Non-communicable diseases, such as hypertension, type 2 diabetes mellitus, breast cancer, cervical cancer, prostate cancer, and many liver and kidney disorders,

can be diagnosed with periodic health examination. One of the objectives of PHE is to teach patients about behavioral patterns and environmental exposures that pose risks of future illnesses (Culica *et al*., 2002). Preventive services, being one of the cornerstones of primary health care, help to check the risky practices of healthy people, provide opportunity for early diagnosis and treatment of existing diseases, and forestall lasting harms of incessant sicknesses. These essential targets are accomplished through PHE, the procedures of which are set by different national and international guidelines (Albaloushi, 20151). Periodic health examination (PHE) opens the door to assessment of health status, especially for older adults because they are more susceptible to chronic diseases, establishes physician-patient relationship, and reduces the need for health consultations (Aydın *et al*., 2017). Screening tests are used to determine whether an asymptomatic individual has an undetected disease or condition. Screening is currently used in many contexts, including in blood pressure monitoring to identify hypertension, in prostate-specific antigen measurement to detect signs of prostate cancer, and in colonoscopy; many of the tests are marketed directly to the patient. The two primary objectives of a good screening program are:

- Detection of disease at a stage when treatment is more effective than it would be after the patient develops signs and symptoms, and
- Identification of risk factors that increase the likelihood of developing the disease and use of this knowledge to prevent or reduce the incidence of the disease by modifying the risk factors(Herman, 2006). A study conducted in 2014 showed that the top ten nations with higher predominance of diabetes were Tokelau (37.5%), Combined States of Micronesia (35%), Marshall Islands (34.9%), Kiribati (28.8%), Cook Islands (25.7%), Vanuatu (24%), Saudi Arabia (23.9%), Nauru (23.3%), Kuwait (23.1%), and Qatar (22.9%). Therefore, Saudi Arabia is among the top ten countries of the world with the highest prevalence of diabetes (if we assume that the data has not changed much since). The World Health Organization (WHO) has reported that Saudi Arabia ranks second-highest in the Middle East (Sun *et al*., 2014).

Moreover, through PHE a few communicable diseases such as hepatitis B could be detected early. Thus, PHE plays a crucial part in keeping human resources healthy and productive. Furthermore, the objectives of periodic health examination areto evaluate health status, screen for risk factors and diseases, and provide preventive counseling interventions in an age-appropriate manner. The goal of screening is to prevent the onset of disease or the worsening of an existing disease. For example, measurement of blood pressure is intended to detect hypertension so as to initiate treatment and prevent subsequent morbidity (e.g., stroke or renal failure) or mortality (Naeem, 2015). Colorectal cancer has been the commonest cancer among men, and the third commonest among ladies, since 2002 in Saudi Arabia (Vilibic-Cavlek *et al*., 2014). A study done in Riyadh found that most respondents accepted that screening for colon cancer shouldstart at the onset of the symptoms (42.9%) (Alsanea, 2015). Among Saudis, hypertension and pre-hypertension prevalence are 15.2% and 40.6% respectively. The chances of hypertension in men increase with age, weight, diabetes, and hypercholesterolemia (Zubaidi *et al*., 2015).

Periodic health examination (PHE) is a form of preventive medicine; it is a useful practice for the promotion of health in the community. Creating awareness for PHE, positively influencing PHE practice, and mitigating factors that prevent its practice in our communities will help in promoting its prevalence among individuals (El Bcheraoui *et al*., 2014). The burden of the common chronic, preventable disease and their serious outcomes make this particular topic enormously essential to evaluate. Therefore, there is need to improve the services of family medicine physicians concerned with the promotion of health. Schoolteachers act as role models for future generations and their beliefs and attitudes indirectly affect the younger generations. As family physicians, prevention and promotion of health are some of the cornerstones, thus investing in this topic fulfills the researcher's aim.

This study is aiming to evaluate the level of knowledge of periodic health examination among teachers, and, therefore, to assess the need to increase the knowledge of and training on PHE. It's main objectives are:

- To measure the level of knowledge of periodic health examination among male secondary school teachers in the western sector of Makkah city in 2019.
- To identify the determinants of the level of knowledge of periodic health examination among male secondary school teachers in the western sector of Makkah city in 2019.

METHODOLOGY

This is a cross-sectional, analytical study- self funded- was conducted through September 2019 in Makkah al-Mukarramah, the holy capital of KSA and Muslims' holiest city on earth , which has a large number of different nationalities and different cultures. There are fifty-six secondary schools in Makkah city. The study was conducted in eighteen of these secondary schools, all of which are located in the western sector of the city. This study population comprised only male secondary school teachers in the western sector of Makkah city. Includes all male teachers working at secondary schools inthe western sector of Makkah city, as well as members of the school administration staff who were once teachers, all nationalities, and different degrees of qualification. Those on assignments outside the western sector and teachers unavailable during the meeting time were excluded. Sample size is calculated according to the Ministry of Education in Makkah, the number of teachers who worked in secondary schools in the western sector during the study period was 479. As far as research efforts could go, there was no available data on the level of knowledge of PHE among teachers as at the time of the study. For this reason, the researcher used 50%, moreover, based upon a confidence level of 95% and a margin of error of 5%. The sample size as calculated using the Raosoft calculator was214 teachers, which was increased by 10% to overcome the non-respondents using simple randomization between eighteen secondary schools to pick the number of schools in the western sector needed to produce the sample size, according to the number of teachers in each school**.** A self-administered questionnaire was used to collect data. The questionnaire included a section for socio-demographic data, a checklist of the level of knowledge of PHE, and measuring scales. The researcher formulated and had the questionnaire reviewed and validated by two family

medicine consultants. Then, the researcher personally visited each school with the questionnaires during breakfast break time, having received approval of the higher authorities. With the permission of the director of each school, the researcher assembled all the available teachers in the meeting room, where a short introduction on the research and its importance were presented. Afterward, the questionnaires were distributed among the teachers. The response rate was low; to boost it, more schools were added out of the eighteen schools by simple randomization. The teachers who were unavailable at the time of the meeting were excluded from the study, according to the exclusion criteria. Each week was allotted to three schools depending on the number of schools included. The level of knowledge and perception of PHE considered as dependent variables whereas age, specialty, nationality, education, occupation and income considered as independent variables:

The researcher used the Statistical Program for Social Sciences (SPSS) software 23.0 for data entry and analysis. Necessary statistical tests such as chi-square test, t-test, and other appropriate tests were used. A p-value of less than 0.05 was adopted for statistical significance. The questionnaire was applied to 10% of the sample size across the male secondary schools in the western sector of Makkah city for the pilot study.

RESULTS

The study included 214 participant teachers, out of the invited 203. Table 1 shows the socio-demographic details of the respondents. It can be seen from the table that 38.4% of participants were aged between 40 and 50, while 32.0% were aged<40.Further, the majority of participants were married (95.6%), while a very small fraction (4.4%) were single.44.3%of the teachers earned monthly income in the range of15000 to20000 SR, while 41.9% earned<15000.Concerning the relevant qualifications, most of the participants (85.2%) had Bachelor's degrees in education, while 14.8% had postgraduate degrees. The majority of the teachers(97.5%) were resident in Makkah, while the percentage of those who lived outside of Makkah was2.5%.

Most of the participants (45.3%)chose "Scheduled visits to the family physician by healthy people for early screening of common diseases and prevention". The response, "Scheduled visits to the family physician by healthy people, based on age and risk factors present, for early screening, prevention and early detection of diseases" was chosen by28.1% of the teachers, and the answer "I do not know" was given by 14.3%.

Majority of the participants(73.9%) did not undergo periodic examination, while the rest (26.1%) claimed they underwent periodic examination. Of those that underwent periodic examination, 52.8% were examined in health care centers of the Ministry of Health (52.8), while 35.8% underwent their periodic examination in hospitals of the Ministry of Health. Regarding being aware of the existence of the periodic examination program at the Ministry of Health, the study results show that well over half of the participants (78.3%) were not aware, while the percentage of those who were aware was 21.7%. Of those who were aware of the program, 40.9% got to know through social media, 25.0% through relatives who worked in the medical field, 15.9% through their doctors, and 25.0% through awareness campaigns.

Of those who were not aware, 80.5% claimed they did not know since there were no awareness campaigns for the program, 42.8% because they had no proper education about the program, and 27.8% because they got "no appointments for regular medical examination." Most of the participants (98.0%) had no medical insurance, while a meagre 2% claimed to have. On the specialty of the doctor whose responsibility it is to provide periodic health examination, 63.5% thought that family doctors were saddled with that responsibility, 25.6% thought it was the responsibility of doctors of public health and society, and 21.7% considered it the responsibility of general practitioners. The majority of our participants were not smokers (71.9 %), 21.2% were smokers, and 6.9% used to smoke but had quit smoking. Of the number that smoked, 39.5% smoked 10 to 20 cigarettes per day, 32.6% smoked less than 10 cigarettes per day, 23.3% smoked 21 to 30 cigarettes per day, and 4.7% smoked over 30 cigarettes per day. As for when they usually smoked the first cigarette each day, 34.9% of the smokers did more than 61 minutes after waking from sleep each morning, 27.9% smoked their first 31 to 60 minutes after waking up, 23.3% within 5 minutes of waking, and 14.0% between 6 and 30 minutes of waking up. Half of those who had quit smoking (50%) did less than 5 years ago, 21.4% did 6 to 10 years ago, 21.4% did 11 to 15 years ago, and 7.1 % stopped smoking over 16 years ago. From the table above, 28.6% of the teachers had been diagnosed with high blood pressure, 21.2% with diabetes, 13.3% with obesity, and 9.4% with other diseases. Regarding the participants' family history of cancer, most of them claimed they came from families with no history of cancer (83.3%), while a positive family history of cancer was admitted by 10.3% of them, while 6.4% were "not sure" if their family had any history of cancer. The majority of the participants had not calculated their BMI in the past year (68.5%), while 31.5% had. Most of the participants had not measured their waist circumference in the last five years (82.3%), while only 17.7% had. About half (50.2%)of the participants had not been screened for blood lipids profile (fats, cholesterol, triglycerides) in the past five years, while 49.8% had checked their blood lipids profile during the same time range. Slightly over half of the participants had had their blood pressure measured in the past six months (53.2%), 17.7% had had the blood pressure measured in the last 1 to 2 years, and 12.3% were not sure the last time they had it measured.

Most of the participants had not been vaccinated against the flu in the past year (74.4%), 20.7% had, and 4.9% were not sure if they were vaccinated. Most of the participants had not got tetanus vaccination in the past 10 years (67.5%), only a paltry 3.0% had got the vaccination in the same time interval, and 28.6% could not say if they had or not. Most of the participants had not got the hepatitis B vaccination (63.1%), 9.9% had got the vaccination, and 27.1% were not sure if they got the vaccination. Again, most of the participants had not got the pneumococcal vaccination (72.9%), a very few (2.5%) had, and24.6% were not sure if they had got the pneumococcal vaccination or not. As for completing all vaccinations according to the Ministry of Health schedule, the majority of participants got all vaccinations according to the schedule (54.2%), 22.2%did not complete the vaccination schedule, and 23.6% were not sure whether they completed the schedule or not. Most of the participants had not been screened for depression (82.8%), very few participants had been screened for depression (4.9%), and12.3% were not sure if they had been screened for depression or not.

Table 1 2019Socio-demographic characteristics of secondary school teachers of the western sector of Makkah

	N	%
Age		
<40	65	32.0
40-50	78	38.4
>50	60	29.6
Social status		
Single	9	4.4
Married	194	95.6
Income		
<15000	85	41.9
15000-20000	90	44.3
>20000	28	13.8
Level of education		
Bachelor's degree	173	85.2
Postgraduate	30	14.8
City of residence		
Makkah	198	97.5
Out of Makkah	5	2.5

Table 1 shows the socio-demographic details of the respondents.

Table 2 Knowledge of periodic health examination among secondary school teachers in western sector, Makkah in 2019

In your opinion, what is the appropriate definition of periodic medical examination?	N	%
Scheduled visits to the family physician by healthy people for early screening of common diseases and prevention.	92	45.3
Scheduled visits to the family physician by healthy people, based on age and risk factors present, for early screening, prevention and early detection of diseases.	57	28.1
Scheduled visits to the health center for people with chronic diseases to ascertain their health.	25	12.3
I don't know.	29	14.3

Table 3. Data on PHE among secondary school teachers of the western sector of Makkah in 2019

	N	%
Have you been examined periodically?		
Yes	53	26.1
No	150	73.9
If yes, where was it done?		
Health center of the Ministry of Health.	28	52.8
Hospitals of the Ministry of Health.	19	35.8
Private medical center (e.g. private complexes and hospitals): specify	5	9.4
Other	1	1.9
Are you aware of the existence of the periodic examination program at the Ministry of Health?		
Yes	44	21.7
No	159	78.3
If yes, please specify how you got to know of the program		
I have a relative who works in the medical field and educated me about the periodic medical examination.	11	25.0
Through social media.	18	40.9
Through awareness campaigns.	11	25.0
I was educated by my doctor.	7	15.9
Other.	2	4.5
If no, please specify the reasons		
I did not get proper education.	68	42.8
There are no campaigns to create awareness for theprogram.	128	80.5
There are no appointments for regular medical examination.	44	27.8
Other.	1	0.6

Table 4Data on medical insuranceamong secondary school teachers of the western sector of Makkah in 2019

	N	%
Do you have medical insurance?		
Yes	4	2.0
No	199	98.0
In your opinion, which doctor is responsible for providing periodic health examination		
Internal Medicine	35	17.2
Family doctor	129	63.5
General practitioner	44	21.7
Doctor of Public Health and Society	52	25.6
Others	2	1.0

Table 5. Data on smoking among secondary school teachers of the western sector of Makkah in 2019

	N	%
Do you smoke?		
Yes	43	21.2
Never	146	71.9
Used to but has quit smoking	14	6.9
If yes, how many cigarettes a day?		
Less than ten (<10)	14	32.6
10-20.	17	39.5
21-30.	10	23.3
More than thirty (>30)	2	4.7
When do you usually take the first cigarette from the time you wake up from sleep in the morning?		
Within 5 minutes from when I wake up	10	23.3
6 to 30 minutes from when I wakeup.	6	14.0
31 to 60 minutes from when I wakeup.	12	27.9
More than 61 minutes from when I wakeup.	15	34.9
If your response is “Used to but has quit smoking,” please how many years ago did you stop smoking?		
Less than 5 years	7	50.0
6 to 10 years	3	21.4
11 to 15 years	3	21.4
More than 16 years	1	7.1

Table 6. Chronic disease data among secondary school teachers of the western sector of Makkah in 2019

	N	%
Have you been diagnosed with one of the following diseases?		
High blood pressure	58	28.6
Diabetes	43	21.2
Kidney disease	3	1.5
Cancer, if any. Please specify the diagnosis	0	0.0
Heart problems such as angina	1	0.5
Diseases of the nervous system such as a stroke in the brain	0	0.0
Obesity	27	13.3
Immune deficiency	0	0.0
Other	19	9.4
Is there anyone in your family who has cancer?		
Yes	21	10.3
No	169	83.3
Not sure	13	6.4
Was BMI (weight / height^2) calculated last year?		
Yes	64	31.5
No	139	68.5
Have you measured your waist circumference in the last five years?		
Yes	36	17.7
No	167	82.3
Have you ever checked your blood lipids profile (fats, cholesterol, triglycerides) in the past five years?		
Yes	101	49.8
No	102	50.2
When last did you measure your blood pressure?		
Over the past six months.	108	53.2
Within 1-2 years.	36	17.7
More than two years ago	15	7.4
Never.	19	9.4
I am not sure.	25	12.3

Table 7. Data about the vaccination status ofsecondary school teachers of the western sector of Makkah in 2019

	N	%
Did you get the flu vaccine last year?		
Yes	42	20.7
No	151	74.4
Not sure	10	4.9
Have you had a tetanus vaccine in the past 10 years?		
Yes	6	3.0
No	139	68.5
Not sure	58	28.6
Have you got the hepatitis B vaccine?		
Yes	20	9.9
No	128	63.1
Not sure	55	27.1
Have you got the pneumonia vaccine?		
Yes	5	2.5
No	148	72.9
Not sure	50	24.6
Have all vaccinations been completed according to the Ministry of Health vaccination schedule?		
Yes	110	54.2
No	45	22.2
Not sure	48	23.6
Have you ever been screened for depression?		
Yes	10	4.9
No	168	82.8
Not sure	25	12.3

Table 8Level of knowledge of PHE among secondary school teachers of the western sector of Makkah in 2019

	N	%
How often do you need to measure your weight and calculate BMI if you are healthy?		
Once a month	45	22.2
Every 3 years	17	8.4
Every six months	66	32.5
Every five years	2	1.0
I don't know	73	36.0
In your opinion, at what age do you need to begin to measure your weight and calculateyour BMI?		
18-29 years	56	27.6
30-34 years	22	10.8
35-39 years	16	7.9
40-44 years	40	19.7
45-49 years	6	3.0
50-54 years	2	1.0
55-59 years	2	1.0
55-59 years	3	1.5
I don't know	56	27.6
In your opinion, at what age do you need to start measuring your blood sugar levels if you are healthy?		
18-29 years	35	17.2
30-34 years	30	14.8
35-39 years	25	12.3
40-44 years	46	22.7
45-49 years	13	6.4
50-54 years	5	2.5
55-59 years	2	1.0
55-59 years	2	1.0
I don't know	45	22.2
How often do you need to measure your blood sugar if you are healthy?		
Once a month	47	23.2
Every six months	76	37.4
Every 3-5 years	11	5.4
More than five years	5	2.5
I don't know	64	31.5

Table 10. Level of knowledge of PHE among secondary school teachers of the western sector of Makkah in 2019

	N	%
In your opinion, at what age should you start regular colonoscopy if you are healthy?		
18-29 years	16	7.9
30-34 years	20	9.9
35-39 years	22	10.8
40-44 years	39	19.2
45-49 years	12	5.9
50-54 years	7	3.4
55-59 years	3	1.5
55-59 years	2	1.0
I don't know	82	40.4
How often should you go for colonoscopy if you are healthy?		
Once a month	13	6.4
Every six months	52	25.6
Every year	34	16.7
Every 10 years	12	5.9
I don't know	92	45.3
In your opinion, at what age should you start a regular CT scan of the lung if you were a smoker?		
18-29 years	26	12.8
30-34 years	23	11.3
35-39 years	18	8.9
40-44 years	30	14.8
45-49 years	8	3.9
50-54 years	1	0.5
55-59 years	3	1.5
I don't know	94	46.3
How often should you have a lung CT scan if you smoked?		
Once a month	21	10.3
Every six months	38	18.7
Every year	26	12.8
Every 3-5 years	13	6.4
I don't know	105	51.7

Regarding the correct time frequency to measure weight, height, and calculate BMI, 36.0%of the participants did not know the correct answer,32.5% got the correct answer (“every six months”), and 22.2% thought it should be “once a month”.

As for the right age range to begin to regularly measure weight, height, and calculate BMI, 27.6%of the participants did not know,32.5% thought it should be 18-29 years, and 19.7% thought it should be 40-44 years.

Table 11. Level of knowledge of PHE among secondary school teachers (aged 50 and above) of the western sector of Makkah in 2019

	N	%
Have you noticed blood or any change in your stool color?		
Yes	7	11.7
No	43	71.7
Not sure	10	16.7
Have you undergone colonoscopy inthe past 10 years?		
Yes	13	21.7
No	47	78.3
If no, please specify the reason:		
I don't see the need.	7	14.9
I don't have time.	5	10.6
I'll do it as soon as possible (procrastination).	6	12.8
I donot haveproper education	23	48.9
Other	6	12.8
Haveyou gone for prostate surface antigen (PSA) blood test in the last one year?		
Yes	5	8.3
No	51	85.0
Not sure	4	6.7

Table 12. Level of knowledge of PHE among secondary school teachers of the western sector of Makkah in 2019

Knowledge			
		N	%
	No knowledge	84	41.4
	Weak knowledge	113	55.7
	Average knowledge	6	3.0
	Total	203	100.0
Score	Range	0-5	
	Mean±SD	1.06±1.126	

Table 13. The relation between level of knowledge of PHE and age among secondary school teachers of the western sector of Makkah in 2019

			Knowledge			Total
			No knowledge	"Weak" knowledge	Average knowledge	
Age	<40	N	29	33	3	65
		%	34.5%	29.2%	50.0%	32.0%
	40-50	N	31	46	1	78
		%	36.9%	40.7%	16.7%	38.4%
	>50	N	24	34	2	60
		%	28.6%	30.1%	33.3%	29.6%
Total		N	84	113	6	203
		%	100.0%	100.0%	100.0%	100.0%
Chi-square		X^2		2.174		
		P-value		0.704		

Table 14. Description of the relation between knowledge of PHE and marital status

			Knowledge			Total
			No knowledge	Weak knowledge	Average knowledge	
Marital status	Single	N	6	3	0	9
		%	7.1%	2.7%	0.0%	4.4%
	Married	N	78	110	6	194
		%	92.9%	97.3%	100.0%	95.6%
Total		N	84	113	6	203
		%	100.0%	100.0%	100.0%	100.0%
Chi-square		X^2		2.761		
		P-value		0.251		

About 22.2%of the participants did not know the age range to begin measuring blood sugar levels even if they were healthy, 22.7% thought it should be40-44 years, 17.2% thought it should be 18-29 years,and14.8% chose the answer 30-34 years. Regarding the frequency with which they should measure their blood sugar level even if healthy, 31.5% of the participants did not know, 37.4% answered "every six months", and 23.2% thought it should be once a month. Regarding the age range to start measuring blood pressure even if one were healthy, 25.1%of the participants did not know,23.2%of the participants chose the answer "40-44 years",16.7% thought it should be 18-29 years,13.3% chose "30-34 years", and 11.3% went for "

Table 15. The relation between the level of knowledge of PHE and income among secondary school teachers of the western sector of Makkah in 2019

			Knowledge			Total
			No knowledge	Weak knowledge	Average knowledge	
Income	Less than 15000 SR	N	38	44	3	85
		%	45.2%	38.9%	50.0%	41.9%
	15000-20000 SR	N	36	53	1	90
		%	42.9%	46.9%	16.7%	44.3%
	More than 20000 SR	N	10	16	2	28
		%	11.9%	14.2%	33.3%	13.8%
Total		N	84	113	6	203
		%	100.0%	100.0%	100.0%	100.0%
Chi-square		X^2		3.542		
		P-value		0.472		

Table 16. The relation between the level of knowledge of PHE and level of education among secondary school teachers of the western sector of Makkah in 2019

			Knowledge			Total
			No knowledge	Weak knowledge	Average knowledge	
Level of education	Bachelor degree	N	73	95	5	173
		%	86.9%	84.1%	83.3%	85.2%
	Postgraduate	N	11	18	1	30
		%	13.1%	15.9%	16.7%	14.8%
Total		N	84	113	6	203
		%	100.0%	100.0%	100.0%	100.0%
Chi-square		X^2		0.328		
		P-value		0.849		

Table 17. The relation between the level of knowledge of PHE and city of residence among secondary school teachers of the western sector of the Makkah in 2019

			Knowledge			Total
			No knowledge	Weak knowledge	Average knowledge	
City of residence	Makkah	N	81	111	6	198
		%	96.4%	98.2%	100.0%	97.5%
	Outside Makkah	N	3	2	0	5
		%	3.6%	1.8%	0.0%	2.5%
Total		N	84	113	6	203
		%	100.0%	100.0%	100.0%	100.0%
Chi-square		X^2		0.927		
		P-value		0.629		

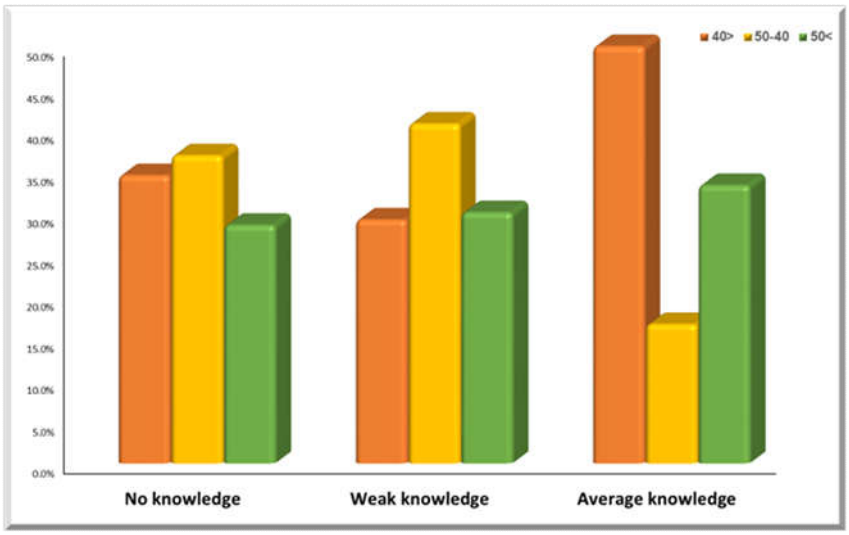

Figure 1The relation between the level of knowledge of PHC and age among secondary school teachers of the western sector of Makkah in 2019

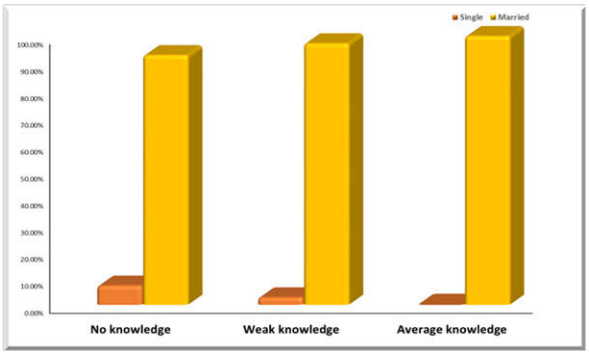

Figure 2The relation between the level of knowledge of PHE and marital status among secondary school teachers of the western sector of Makkah in 2019.

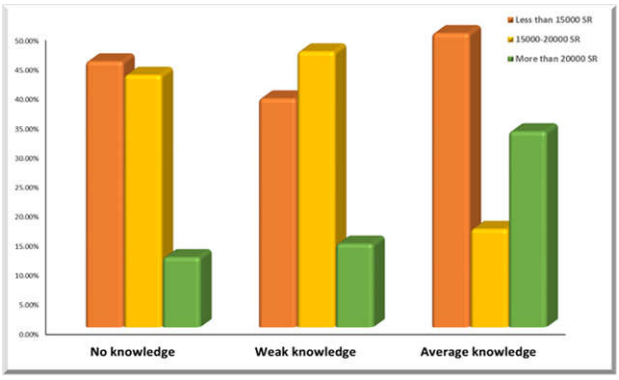

Figure 3. The relation between the level of knowledge of PHE and income among secondary school teachers of the western sector of Makkah in 2019

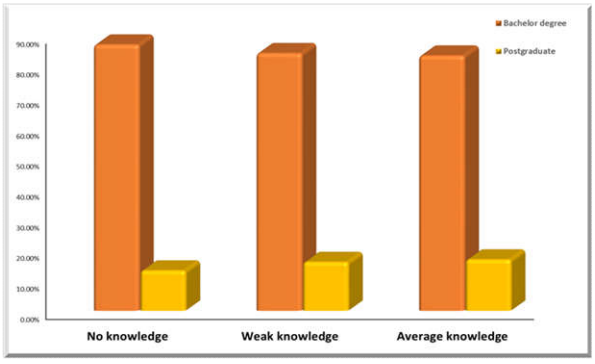

Figure 4. The relation between the level of Knowledge on PHE and level of education among secondary school teachers of the western sector of Makkah in 2019.

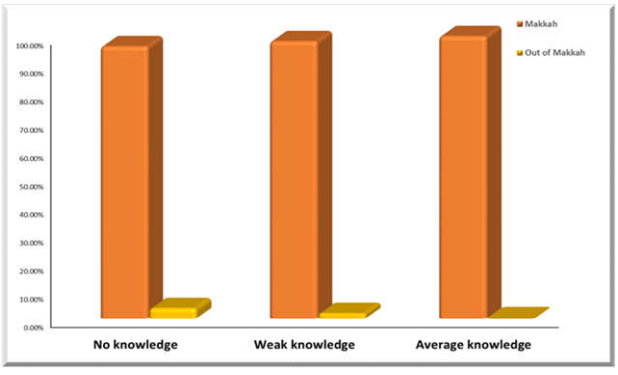

Figure 5The relation between the level of knowledge of PHE and city of residence among secondary school teachers of western the sector of Makkah in 2019

35-39 years". About how often they should measure their blood pressure even if they were healthy, 37.4%of the participants chose the answer "every six months",29.1% chose the answer "once a month", and 24.6% of the participants went for "I do not know". As for what age range one should start measuring their blood lipids values if one were healthy, 27.6% of the participants had no idea, 22.7%chose "40-44 years", 15.8% opted for "18-29 years",13.8% for "30-34 years",and11.3% for "35-39 years". Regarding how often blood lipids values should be measured even if one were healthy, 41.9% of the participants thought it should be "every six months",33.0% had no idea, 12.8%though it should be every 3-5 years, and 11.3% thought it should be once a month. Regarding the age range to start regular colonoscopy even if one were healthy, 40.4%of the participants had no idea, 19.2% thought it should be 40-44 years,10.8% opted for "35-39 years", and 9.9% for "30-34 years". Regarding how often the participants should go for colonoscopy even if they were healthy, 45.3%of the participants chose the answer "I do not know",25.6% chose the answer "every six months",16.7% opted for "every year",and6.4% for "once a month". About 46.3%of the participants had no idea at what age range they should start regular CT scans if they smoked, 14.8% felt it should be 40-44 years, 12.8% opted for 18-29 years, and 11.3% for 30-34 years. Regarding how often the participants should have lung CT scans if they smoked, 51.7%of the participants chose the answer "I do not know", 18.7% chose the answer "every 6 months", 12.8% opted for "every year", and 10.3% for" once a month". Of the participants who were 50 years or older, most (71.7%) answered no to the question "Have you noticed blood or any change in your stool color?", 16.7% answered "not sure", and 11.7%answered yes. Majority of the participants aged 50 or more (78.3%) had not undergone colonoscopy in the past 10 years, whereas 21.7% had. Of those who had not had colonoscopy during this time interval, 48.9% said their reason was not having proper education on the need for it, 14.9% did not see the need for it, 12.8% kept postponing going for colonoscopy and never got around to doing it, and 10.8% felt they had no time. Majority of the participants aged 50 or more (85.0%) had not done PSA blood test in the last one year, 8.3% had, and 6.7% did not know if they had or not. More than half of the participants (55.7%) had "weak" knowledge of periodic health examination,41.4% had no knowledge at all, and 3.0% had average knowledge. The range is 0-5 and the Mean± SD is 1.06±1.126.

More than half of the participants (55.7%) had "weak" knowledge of PHE. Our study shows no significant relation between knowledge of PHE and age of the participants (p-value <0.704 and Chi-square = 2.174). Of all 113 participants who had "weak" knowledge of PHE, 40.7% fell in the age range 40-50 years, 30.1% in the range >50 years, and 29.2% in the <40 years age range. Of the 6 participants that had average knowledge of PHE, 33.3% were aged above 50, 50% were aged below 40, and 16.7% were aged between 40 and 50. As for the 84 that had no knowledge of PHE, 36.9% were aged 40-50, 34.5% were aged below 40, and 28.6% were aged over 50. Our study shows no significant relationship between PHE knowledge and marital status, with a p-value <0.251 and Chi-square = 2.761. Of the 78 teachers who had no knowledge of PHE, 7.1% were single, whereas 92.9% were married. Of the 113 who had weak knowledge, 97.3% were married and 2.7% were single. All 6 participants with average knowledge were married. Our analysis shows no significant relationship between knowledge of PHE and income, with p-value <0.472

and Chi-square = 3.542. Of the 84 teachers with no knowledge of PHE, 45.2% earned less than 15000 SR,42.9% earned 15000-20000 SR, and 11.9% earned more than 20000 SR. Of the 113 with weak knowledge, 46.9% earned between 15000-2000 SR, 38.9% earned less than 15000 RS, and 14.2% earned more than 20000 RS. Of the participants with average knowledge,50.0% earned less than 15000 SR,33.3% earned more than 20000 SR, and 16.7% earned 15000- 20000 SR. The study shows no significant relationship between knowledge of PHE and level of education, with p-value <0.849 and Chi-square = 0.328. Of all participants with no knowledge of PHE, 86.9% had Bachelor's degrees and 13.1% had postgraduate degrees. Of those with weak PHE knowledge, 84.1% had Bachelor's degrees and 15.9% had postgraduate degrees. Of those with average knowledge, 83.3% had Bachelor's degrees and 16.7% had postgraduate degrees. The study shows no significant relationship between PHE knowledge and city of residence, with p-value <0.629 and Chi-square = 0.927. 96.4% of those with no PHE knowledge lived in Makkah, while 3.6% of the same set lived outside Makkah. 98.2% of those with weak knowledge lived in Makkah, while 1.8% lived outside Makkah. All 6 participants with average knowledge lived in Makkah.

DISCUSSION

Periodic health examination (PHE) is a form of preventive medical service, which is associated with reduced morbidity and mortality and may lead to early diagnosis of illness and reduced health care cost (20). This study was conducted to evaluate the level of knowledge of periodic health examination among teachers and, therefore, to assess the need to increasing the knowledge of and training on PHE. A good number of the respondents (45.3%) were aware of the appropriate definition of periodic health examination (see Table 2), and this data corresponds with related data in other parts of the world (Broyles *et al*., 2000). The majority of participants (73.9%) did not go for periodic examination. This could be due to the participants' lack of information about the PHE service at the Ministry of Health, as indeed the results show that well over half of the participants (78.3%) were not aware of this service. Most of the participants (80.5%) attributed the low level of awareness to inadequate campaigns about the service (see table 3). More than half of the participants (55.7%) had "weak" knowledge of periodic health examination, 41.4% had no knowledge, and 3.0% had average knowledge, with a range of 0-5 and Mean ±SD of 1.06±1.126. .The reason for this majorly no and weak knowledge may be attributed to work stress, since participants were often busy and never got to attend sensitization programs on PHE, level of education, and age. These findings correspond with those in studies focused on other parts of the world (Chee, 2003).

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