Original Research Article.

Assessment of Awareness and Knowledge of Medical Students and Interns about Conditions Relevant to Metabolic Syndrome at King Khalid University

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ABSTRACT

Introduction: The metabolic syndrome is defined by the National Cholesterol Education Program (NCEP) as three or more of the following: fasting plasma glucose levels ≥ 6.1 mmol/liter, serum triglycerides ≥ 1.7 mmol/liter, serum HDL cholesterol < 1.0 mmol/liter, blood pressure ≥ 130/85 mmHg, and waist girth > 102 cm. Use of waist circumference > 94 cm was suggested for some men who might be genetically susceptible to insulin resistance.

Methodology: A self-reported online questionnaire was administered to 110 medical students and interns at King Khalid University. Questions were covered the following condition: diabetes, hypertension, high serum cholesterol, arteriosclerosis, stroke, and myocardial infarction.

Results: A sample of 110 students and interns (70% males and 30% females), participated in this study, 25.9 % were 5th year medical students, 30.4 % were 6th medical students, 43.8% were medical intern. Students showed good knowledge regarding most of items addressing condition relevant to metabolic syndrome.

Conclusion: Students and interns at King Khalid University show adequate level of knowledge in regard condition relevant to metabolic syndrome.

Keywords: Metabolic Syndrome, Insulin Resistance, Saudi Arabia.

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INTRODUCTION

The metabolic syndrome is defined by the National Cholesterol Education Program (NCEP) as three or more of the following: fasting plasma glucose levels ≥ 6.1 mmol/liter, serum triglycerides ≥ 1.7 mmol/liter, serum HDL cholesterol < 1.0 mmol/liter, blood pressure ≥ 130/85 mmHg, and waist girth > 102 cm. Use of waist circumference > 94 cm was suggested for some men who might be genetically susceptible to insulin resistance.[1]

Current literature indicates that metabolic syndrome is prevalent and it is increasing over time.[2] Estimates from the 2003–2006 National Health and Nutrition Examination Survey (NHANES) suggest that 34% of U.S. adults aged 20 years and over have metabolic syndrome.[3]

The prevalence of metabolic syndrome is high in Saudi Arabia. Low HDL affects 81.8% of females and 74.8% of males with MS leading all other factors, and it continued to be consistent in all different age groups. Metabolic syndrome is a risk factor for CAD, as the prevalence of CAD was higher among patients with MS (6.7%) compared to subjects without MS (4.6%) (p<0.0001).[4]

Currently, there is very little information in the literature about studies examining students' knowledge of conditions relevant to metabolic syndrome. Current literature indicates that most college students are unaware of metabolic syndrome or CVD risk factors and that some students hold false beliefs about CVD complications.[5,6] The purpose of this study was to assess medical student and interns level of awareness and knowledge about conditions relevant to metabolic syndrome .

METHODOLOGY

A self-reported online questionnaire was administered to 110 medical students and interns at King Khalid University. Questions were covered the following condition: diabetes (10 questions), hypertension (9 questions), high serum cholesterol (3 questions),

arteriosclerosis (11 questions), stroke (9 questions), and myocardial infarction (8 questions). The questions about the outcome and treatment of these conditions, and a description of physical changes relevant to metabolic syndrome.

Ethical Consideration

The study proposal was sanctioned by the ethical committee of the college. Study was explained to participant and informed consent was taken from the participant.

Statistical Analysis

The collected Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) statistical program version 19.
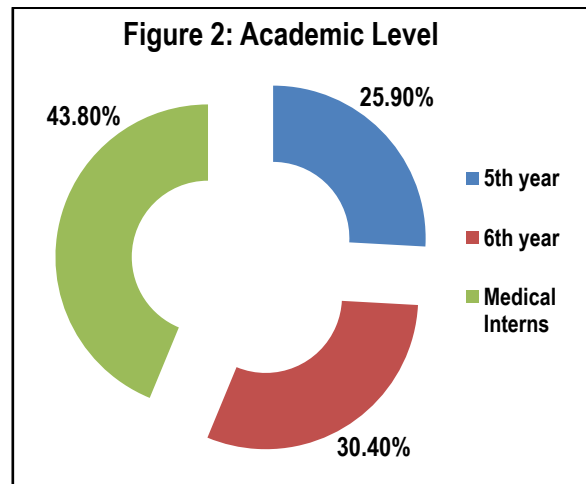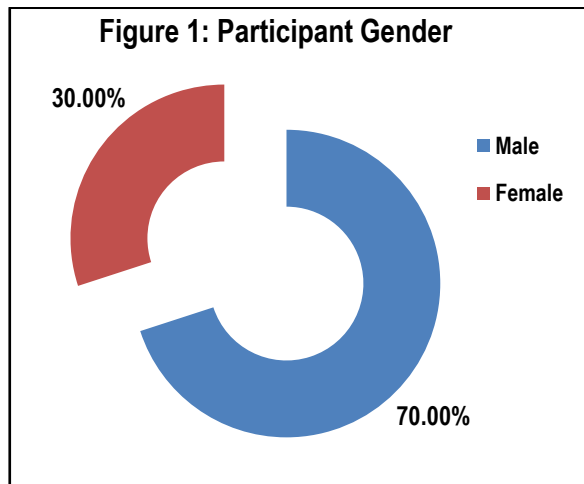

Figure 1: Participant Gender

Figure 2: Academic Level

Table 1: Diabetes Questions

Questions	Correct answer	Male (Total : 77)		Female (Total :33)	
		True	False	True	False
There are several different types of diabetes?	True	77	0	32	1
Pregnant women have a reduced risk of acquiring diabetes?	False	12	65	6	27
Eye disorders can be consequences of diabetes?	True	76	1	32	1
Hereditary factors play only a minor role in the development of diabetes?	False	7	70	11	22
For some individuals with diabetes it is not advisable to take insulin?	True	60	17	25	8
Poor appetite is a frequent symptom of diabetes?	False	18	58	10	23
With diabetes, too much sugar enters the cells?	False	12	64	14	19
Frequent urination is a classic symptom of diabetes?	True	75	2	31	2
Arteriosclerosis is one of the sequential of diabetes?	True	67	8	29	4
Individuals with diabetes must have insulin shots?	False	25	51	13	20

Table 2: Hypertension Questions

Questions	Correct answer	Male		Female	
		True	False	True	False
Hypertension can cause dizziness?	True	60	16	28	5
Hypertension is associated with heredity?	True	60	16	26	7
Pregnant women are less likely to suffer from hypertension?	False	8	68	3	30
After medication has lowered hypertension, the medication can usually be discontinued?	False	11	64	7	26
Individuals with hypertension are less likely to suffer from arteriosclerosis?	False	9	67	6	27
Hypertension can be caused by disorders of the thyroid gland?	True	55	21	24	9
Hypertension can cause renal damage?	True	74	2	33	0
Hypertension can lead to eye disorders?	True	73	3	32	1
Hypertension can be caused by cerebral tumors?	True	50	26	15	18

RESULTS

A sample of 110 students and interns (70% males and 30% females), participated in this study. (Figure 1)

A 25.9 % were 5th year medical students, 30.4 % were 6th medical students, 43.8% were medical intern. (Figure 2)

As shown in Table 1, students showed good knowledge about diabetes in regard to diabetes types, diabetes complications and symptoms. As 100 % of male and 96.9 % of female students and interns knows that diabetic has several types, Polyuria was identified by 96% of students as a common symptom of diabetes and 77% identified poor appetite as wrong symptoms. Regarding diabetic risk factor, pathophysiology and treatment, 83.9% of all participants identify that hereditary factor can play a role in the development of diabetes, 84.4% of male and only 66.6 % of female participants know that pregnancy can increase the risk of developing diabetic and 35.1 % thought that all patients with

diabetes must take insulin injections. In terms of hypertension (Table 2), 90.1% of students knew that pregnant women were more likely to suffer from hypertension than non-pregnant women. more than 81.1 % of students(77.9 % of male , 84.8% of female students) knew that individuals with hypertension may complain of dizziness, About 79.3% of students were aware that hereditary factors can contribute to hypertension. Out of 110 only 18 (16.4%) students (11 male and 7 female) assumed that antihypertensive medications could be discontinued once blood pressure was under control. Complications of untreated hypertension, such as kidney and eye diseases, were identified by 96% of students.

Table 3: High cholesterol Questions

Questions	Correct answer	Male		Female	
		True	False	True	False
High serum cholesterol promotes arteriosclerosis.	True	71	4	33	0
High serum cholesterol can be treated with medication.	True	70	6	28	5
High serum cholesterol is not associated with hereditary factors.	False	13	63	11	22

Table 4: Arteriosclerosis Questions

Questions	Correct answer	Male		Female	
		True	False	True	False
Arteriosclerosis increases the risk of suffering a stroke.	True	74	2	32	1
Leg pains are a symptom of arteriosclerosis	True	63	12	22	11
With arteriosclerosis, arteries become softer.	False	18	58	11	22
Arteriosclerosis can be cured completely.	False	22	54	16	16
Arteriosclerosis can cause renal damage.	True	67	8	26	7
As a result of arteriosclerosis, blood pressure is likely to decline.	False	21	54	11	22
With arteriosclerosis, arteries become less elastic.	True	67	8	31	2
With arteriosclerosis, blood platelets accumulate on the arterial walls.	True	60	15	29	4
High blood pressure and arteriosclerosis are not linked with each other.	False	9	66	6	27
Medication can remove completely sediments from the arteries	False	22	53	12	21
With arteriosclerosis, fat accumulates on the arterial walls	True	66	9	29	3

Table 5: Stroke Questions

Questions	Correct answer	Male		Female	
		True	False	True	False
If a patient survives a stroke, there are usually no permanent consequences.	False	24	51	14	19
Permanent speech defects are possible consequences of a stroke.	True	70	5	32	1
A stroke is often followed by memory dysfunction	True	48	27	23	10
There are different types of strokes.	True	67	8	29	4
A stroke is preceded frequently by speech problems.	True	61	14	24	9
A stroke is caused by artery obstruction.	True	65	9	31	2
A stroke is caused when overexcited cells produce too much electricity.	False	15	60	7	25
Individuals with diabetes are more likely to suffer a stroke.	True	60	15	33	0
A stroke is preceded frequently by chest pains.	False	14	61	11	20

Table 6: Myocardial Infarction Questions

Questions	Correct answer	Male		Female	
		True	False	True	False
Hereditary factors play a role in the risk of suffering a myocardial infarction.	True	61	14	27	5
After a myocardial infarction, anticoagulants are administered.	True	60	14	28	5
A myocardial infarction is often preceded by shortness of breath.	True	66	9	30	3
A myocardial infarction is caused by arterial obstruction.	True	65	9	31	2
After a myocardial infarction has occurred, parts of the cardiac muscle tissue can die.	True	63	12	28	4
With a myocardial infarction, cardiac muscle tissue dies.	True	60	15	25	8
A myocardial infarction must be treated surgically	False	24	50	10	23
A myocardial infarction is caused by malfunction of one or more heart valves.	False	28	48	17	16

As shown in table 3, more than 90.1 % of students knew that individuals with high serum cholesterol can be treated with diet and medications. 92.2 % of male and 100 % of female students identify high cholesterol promotes arteriosclerosis

Arteriosclerosis was clear to many students in regard to disease characteristics, symptoms, and risk factors. For example, 79.1% of the students correctly identified leg pain as a symptom of arteriosclerosis, 97.3 % (96.1% of males and 96.9 % of females) knew that arteriosclerosis increases the risk of suffering a stroke, 86.2 % of the students knew that there is a relationship between hypertension and arteriosclerosis. (Table 4)

As for the stroke questions, most students indicated good knowledge about causes, symptoms and complications of stroke. For example, 94.5 % of students knew that a permanent speech defect is a potential consequence of stroke. 78.2 % of the students were aware that a stroke is usually preceded by speech problems and only 65.5 % of students (62.3 % of male, 69.9 % of female) knew that a stroke is often followed by a memory dysfunction. (Table 5)

Students indicated good knowledge about myocardial infarction in terms of causes, symptoms and treatment. 89.9 % of students knew that obstructive coronary artery disease may cause myocardial infarction. More females (90%) than males (85.7%) knew that shortness of breath may precede a myocardial infarction which may lead to permanent damage of the affected heart tissue (84.8 % of females vs. 81.8% of males), and 82.6 % of the students were aware that anticoagulant medications are administered after a myocardial infarction. (Table 6)

DISCUSSION
Study's results show that students were aware about most of condition relevant to metabolic syndrome.

There were some false beliefs held by students. For example, 35.1 % of the students falsely believed that all individuals with diabetes must take insulin injections.

Majority of students correctly identified symptoms and complications of diabetes. Diabetes is a serious health problem and it is the seventh leading cause of death in the United States.[7] Thus, educating students about this disease as a first step in awareness and knowledge is important as a precursor to other health education efforts that could lead to actual behavior changes to reduce their personal risk of developing diabetes or metabolic syndrome later in life.

In this study, findings related to the hypertension questions indicated that the majority of students knew that hypertension can be manifested as dizziness, is linked to the genetic makeup of an individual, and heredity is a risk factor for this condition.

As for arteriosclerosis questions, 96.3% of students were aware that arteriosclerosis can increase the risk of suffering a stroke, but 34.5% of the students falsely believed arteriosclerosis can be cured completely .

CONCLUSION
Given the increasing prevalence of metabolic syndrome among college-aged adults, raising awareness about metabolic syndrome among this age group is important to reduce the prevalence of this condition. Colleges and universities are ideal settings to educate students about health issues. In this study students and interns at King Khalid University show adequate level of knowledge in regard condition relevant to metabolic syndrome with small gender difference.

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