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Self-reported Knowledge of School Students and their Teachers - Risks and Prevention of Coronary Heart Disease

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Objective: To determine self-reported knowledge of school students and their teachers of risk factors and prevention of coronary heart disease (CHD).

Methods: Third grade intermediate and all three grades of secondary school male and female students in Al Khobar area were selected. Multistage stratified sampling design was adopted. A total of 2571 students was selected comprising 1240 males and 1331 females. All teachers in the selected schools were included (142 males and 210 females). Two sets of self-administered questionnaires were used: one for male students and their teachers and one for female students and their teachers.

Results: Male and female teachers had significantly better knowledge of CHD risk factors than their students (except for smoking). However, knowledge of both male students and their teachers about causes of CHD (except for smoking) was unsatisfactory (<30% for students verses <55% for teachers). Knowledge of both male students and their teachers about diabetes mellitus as a risk factor was very poor (12% for students verses 18% for teachers). Female teachers had significantly better knowledge about CHD risk factors than their students. The majority of male students and their teachers considered abstinence from smoking and practice of physical exercise as the main preventive measures for CHD. Self-reported knowledge of female students and their teachers about preventive measure for CHD followed the same pattern as for the males. The main sources of knowledge about health and disease as reported by male and female students were television (58% males verses 61% females) and magazines (31% males verses 39% females). Primary health care centers were the least source of knowledge (17% by males and 16% by females).

Conclusion: The study findings point to some problems in the health knowledge and life-style pattern of school students as well as teachers, which calls for a competent system of health education to be directed to this important target group in the society. It is recommended that health promotion and disease prevention concepts and strategies be included as part of the school curriculum.

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Several studies showed the magnitude of the problem of CHD and risk factors in Saudi Arabia. Hospital-based studies showed that smoking, hypertension, and diabetes mellitus were the common risk factors among patients with acute myocardial infarction[1-3]. A recent national survey showed an increasing prevalence of DM, obesity and hypercholesterolemia[4]. Knowledge of the causative factors and methods of prevention of CHD are essential to reduce morbidity and mortality. A study of the prevalence of cardiovascular risk factors, attitudes and behavior for Saudis 20 years and above, showed that only 15.7% with high dietary fat intake perceived their diet to be a health risk, 16.5% of obese people perceived their body build to be a health risk and 22.6% of inactive people perceived their inactivity as harmful to health[5]. The same study revealed a high prevalence of smoking (35.4%) and obesity (23.4%) in males, with even a higher prevalence of obesity in females (52.3%).

A study in Washington, USA[6], revealed that body fatness in White and Black children and adolescents was a significant predictor of cardiovascular disease risk factors. A study of 391 Western Australians adolescents of both sexes (mean age 15.8 years) showed that nutritional knowledge, particularly concerning fat, was deficient[7]. The study demonstrated that ignorance about nutrients was one of the important barriers to healthy eating. Several studies and community-based programs have shown the effectiveness of long-term health education and other interventions on the prevention and control of CHD risk factors mainly smoking, dietary habits, high blood pressure and physical inactivity[8-12]. Studies from Saudi Arabia have documented the existence of faulty life style patterns and obesity, and its association with problems of coronary heart disease, hypertension and diabetes mellitus[13,14].

Children and adolescents need to have proper knowledge of risk factors for CHD so that they can adopt healthy lifestyle throughout their lives. This will eventually lead to disease prevention and avoidance of premature morbidity and mortality. Therefore health education programs in schools may be an effective primary prevention strategy. It is hypothesized that knowledge of school students and their teachers in Al Khobar area about risk factors and prevention of CHD is inadequate. The aim of this study was to determine self-reported knowledge of school students and their teachers of risk factors and prevention of CHD.

METHODS

This was a cross-sectional study conducted in Al Khobar area, Eastern Province of Saudi Arabia in 1998, from 24.10.1998 to 16.12.1998. The target population consisted of third grade intermediate and all three grades of secondary school male and female students (both Saudis and Non-Saudis) in Al Khobar area. Multistage stratified self-weighting sampling design was adopted. All schools were divided into males (38 schools) and females (45 schools) categories. Then each category of school was divided into government and private and further classification was made on the basis of intermediate and secondary levels.

At first stage, a systematic random sampling procedure (probability proportional to size sampling) was used to select schools (11 schools for boys and 13 schools for

girls). At the second stage the classes were selected at each level using simple random sampling design. All students in the selected classes were included in the study. The total number of selected students was 2571, comprising 1240 males and 1331 females.
Of the male students, 74.8% belong to government and 25.2% belong to private schools. Of the female students, 72.8% belong to government and 27.2% belong to private schools.

All teachers in the selected schools were included in the sample. There were 142 male teachers, 75.4% belong to government and 24.6% to private schools, while 62.7% were intermediate school teachers. The total number of female teachers was 210, 66.7 % belong to government and 33.3% to private schools, while 47.6% were intermediate school teachers.

Two sets of self-administered questionnaires were used: one for male students and their teachers and one for female students and their teachers. Three male physicians participated in the data collection for male schools. For female schools, a pharmacist from the school health services in Al Khobar area, who had experience in research and had done a similar fieldwork previously in the girl's schools, and two female nurses participated in data collection.

Five meetings were held between the research team and the field workers. The questionnaires were discussed in details, each question was explained thoroughly, some questions were modified, and others were deleted. A pilot study was conducted in a male secondary school in Dhahran City to test the questionnaires and organizational procedures such as time taken for filling a questionnaire. Two meetings were held with the field workers where the questions were discussed and the questionnaires were finalized. Fieldwork took about 7 weeks (November- December, 1998). The authors supervised fieldwork.

The questionnaires were coded by the research team and data were entered into SPSSPC computer software[15]. Difference between two proportions was used to detect any significant difference between male and female students. Reliability of questions was done using test-retest method. Reliability was calculated for each question concerned with self-reported knowledge and behavior. Kappa statistic was found to range from 0.4 to 0.7. This was considered as fair to good reliability[16].

RESULTS

The study sample comprised a total number of students of 2428, in addition to 352 teachers, who were of both male and female gender. The sample showed a slight excess of female students (54.7%) over males (45.3%). As seen in Table 1, the overall mean age of students was 16.5±1.8 years. Students from government and private schools constituted 73.3% and 26.7%, respectively. Two-thirds of the students were in the secondary school grade. Saudi students constituted the majority.

Table 1. Characteristics of school students (M&F)

Demographic characteristic	Males No.	%	Females No.	%	Total No.	%
Type of school :						
Government	822	74.8	967	72.8	1789	73.3
Private	277	25.2	362	27.2	639	26.3
School level :						
Intermediate	508	41.0	342	25.7	850	33.1
Secondary	732	59.0	988	74.3	1720	66.9
Nationality :						
Saudis	836	69.8	1276	96.1	2112	83.6
Non-Saudis	362	30.2	52	3.9	414	16.4
Age : (mean $\pm$ 1SD)	16.5 $\pm$ 1.8		16.1 $\pm$ 1.7		16.3 $\pm$ 1.7	

Three hundred and fifty two teachers participated in the study, with males and females constituting 40.3% and 59.7%, respectively. Teachers working in government schools were 70.1% of the total sample, and those in the intermediate and secondary levels were 53.7% and 46.3%, respectively. Similar to students, the majority of teachers (77.8%) were Saudi nationals.

Table 2, shows the self-reported knowledge of male students and their teachers about risk factors for CHD. Male teachers had significantly better knowledge than their students (except for smoking) did. However, knowledge of both male students and their teachers about causes of CHD (except for smoking) was unsatisfactory ($\leq$30% for students Vs $\leq$55% for teachers). Knowledge of both male students and their teachers about diabetes mellitus as a risk factor was very poor (12% for students Vs 18% for teachers).

Table 2. Knowledge of male students and their teachers of risk factors for coronary heart disease (CHD)

Risk factor for CHD	Male Students (n= 1240) No. (%)	Male Teachers (n= 142) No. (%)	p-value (x^2-test)
Smoking	940(75.8)	113(79.6)	NS
Hypertension	247(19.9)	56(39.4)	0.000
Diabetes mellitus	146(11.8)	26(18.3)	0.025
Obesity	250(20.2)	78(54.9)	0.000
Lack of physical exercise	360(29.0)	71(50.0)	0.000
Psychological stress	376(30.3)	70(49.3)	0.000

NS = Not Significant

Female teachers had significantly better knowledge about CHD risk factors than their students did as shown in Table 3. Again, only a small proportion of female students and their teachers recognized diabetes mellitus as a major risk factor for CHD (10%

for students Vs 19% for teachers). Both students and their teachers considered psychological stress as a second cause of CHD.

Table 3. Knowledge of female students and their teachers of risk factors for coronary heart disease (CHD)

Risk factor for CHD	Female Students (n= 1331) No. (%)	Female Teachers (n= 210) No. (%)	p-value (x^2-test)
Smoking	927(69.7)	161(76.7)	0.038
Hypertension	356(26.7)	121(57.6)	0.000
Diabetes mellitus	134(10.1)	40(19.0)	0.000
Obesity	333(25.0)	135(64.3)	0.000
Lack of physical exercise	260(19.5)	89(42.4)	0.000
Psychological stress	387(29.1)	136(64.8)	0.000

The majority of male students and their teachers considered abstinence from smoking and practice of physical exercise as the main preventive measures for CHD (Table 4). This table also shows that male teachers' knowledge was significantly better than their students. Only a small proportion of male students and their teachers recognized management and control of diabetes mellitus as a preventive measure.

Table 4. Knowledge of male students and their teachers of Preventive measures for coronary heart disease

Preventive measures For CHD	Male Students (n= 1240) No. (%)	Male Teachers (n= 142) No. (%)	p-value (x^2-test)
Abstinence from smoking	823(66.5)	119(83.8)	0.000
Management of hypertension	224(18.1)	55(38.7)	0.000
Management & control of Diabetes mellitus	159(12.8)	32(22.5)	0.001
Balanced food	489(39.5)	105(73.9)	0.000
Practice of physical exercise	869(70.3)	129(90.8)	0.000

Self-reported knowledge of female students and their teachers about preventive measure for CHD followed the same pattern as for the males. Female teachers had statistically significantly better knowledge of risk factors than their students did. Similarly management and control of diabetes mellitus was the least to be mentioned as a preventive measure for CHD by both female students and their teachers.

The main sources of knowledge about health and disease as reported by both male and female students were television (58% males vs. 61% females), magazines (31%

males vs. 39% females) and daily newspapers (33% males vs. 34% females) as shown in Table 5.

Table 5. Sources of knowledge of health and disease as reported by students (M&F) in Al Khobar Area

Source of knowledge about Health & disease	Males (n=1240) No. (%)	Females (n=1331) No. (%)	p-value (x^2-test)
Primary health care centers	216 (17.4)	209 (15.7)	NS
Hospitals	291 (23.5)	381 (28.6)	0.003
Schools	355 (28.6)	432 (32.5)	0.035
Daily newspapers	408 (32.9)	458 (34.4)	NS
Magazines	387 (31.2)	519 (39.0)	0.000
Books	308 (24.8)	374 (28.1)	NS
Radio	292 (23.5)	296 (22.2)	NS
Television	723 (58.3)	811 (60.9)	NS

DISCUSSION

Students and teachers knowledge of hypertension, diabetes mellitus, and obesity as risk factors was rather inadequate. This reflects lack of knowledge about these diseases that are recognized as risk factors, although they are common in Saudi Arabia. This result is consistent with the Syrian study of smoking pattern of school teachers, which showed that less than 10% of both male and female teachers recognized smoking as a health hazard for the cardiovascular system[17].

A study of risk factors and attitudes towards CHD in Abha, Saudi Arabia, showed that 15.7% with high dietary fat intake perceived their diet to be a health risk, 16.5% obese people perceived their body build to be a health risk, and 22.6% of physically inactive people perceived their inactivity as harmful to health[18]. A multinational comparison of health knowledge of college students of 11 diseases and conditions in Canada, Nigeria and the United States, showed that chronic disease was the least of health knowledge among the Canadian and Nigerian students[19].

Almost three-quarters of students were aware that smoking is a risk factor for coronary heart disease. This may be due to the widespread publicity. A study of female university students in Riyadh showed that 99.7% were aware of the adverse effects of smoking[20]. A study of cigarette smoking behavior among South African Indian high school students showed that 49% were aware that smoking was associated with heart disease and 45% answered “don’t know”[21].

The study has shown a sizable proportion of students who were aware that abandonment of smoking and practice of physical exercise is an important preventive measure against development of coronary heart disease. The same awareness was observed among teachers who were also able to perceive that proper control of hypertension and diabetes mellitus will also have a preventive effect towards development of coronary heart disease. A study among male and female attendees of a primary health care center in Al Khobar city showed that less than half of them had

knowledge of causes and prevention of CHD (41.0% and 41.1% respectively)[22]. This study also showed a poor knowledge of diabetes mellitus as a risk factor for CHD, which was recognized by 4% of the attendees.

Knowledge about risk factors for CHD, especially DM, which is a common public health problem in Saudi Arabia[23-25], is a necessary ingredient in behavioral change.

Evaluation of the effects of a community-wide health education program on cardiovascular risk factors (The Stanford Five-City Project)[8-10,26] after 5 1/3 years of intervention showed considerable favourable changes in knowledge of risk factors (BP, plasma cholesterol levels, smoking rate, body weight, and resting pulse rate) in the intervention cities compared with the control cities.

The study has shown that the main source for health knowledge for students was the television while the least was the primary health care center. This can be accounted for by the modern life-style pattern that characterizes urban Saudi Arabian cities and towns; and secondly by the lack of orientation about the role of the primary health care center in the society.

It is recommended that health promotion and disease prevention concepts and strategies be included as part of the school curriculum. Primary health care centers should have a more active role in providing health education on healthy life-style to individuals and families.

CONCLUSION

This study shows that male and female teachers had significantly better knowledge of CHD risk factors than their students. However, knowledge of both male students and their teachers about causes of CHD was unsatisfactory. The majority of male students and their teachers considered abstinence from smoking and practice of physical exercise as the main preventive measures for CHD. Self-reported knowledge of female students and their teachers about preventive measure for CHD was inadequate. Primary health care centers were the least source of knowledge (17% by males and 16% by females).

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