Knowledge and Perception of Non-Communicable Diseases and Their Risk Factors among Secondry School Students InJazan, Saudi Arabia

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Abstract
Background: *Non-communicable diseases (NCDs) constitute a large group of diseases that are of long duration. Assessing the knowledge and attitude of young adolescents at schools regarding NCDs and their risk factors would help in identifying their misconception regarding this issue and putting programs to correct them.*
Subjects and Methods: *A cross-sectional study was carried out on a representative sample of secondary school male students enrolled in Jazan governmental schools during the scholastic year 2015-2016 with the objective to explore their knowledge and perception about common NCDs and their risk factors. Two-stage random sampling technique was adopted. Semi-structured valid self-administered questionnaire was used for data collection. The study included 332 students with a response rate of 95.7%.*
Results: *Respondents age ranged between 15 and 21 years with a mean±SD of 17.3±1.3 years. The most frequent recognized NCD was diabetes mellitus (75.3%), followed by cardiac diseases (60.2%), bronchial asthma (57.2%), cancer (51.8%) and hypertension (51.2%). Overall, almost two-thirds of the students (66.3%) had insufficient knowledge regarding hypertension diagnostic value, risk factors and symptomatology. Regarding diabetes mellitus, more than half of the students (55.1%) had insufficient knowledge regarding diabetes mellitus diagnostic value, risk factors, symptomatology and complications. Majority of the students (83.1%) had insufficient knowledge regarding heart diseases risk factors. For all studied NCDs, most of the students (76.2%) had insufficient knowledge. It could be concluded that most of secondary school male students in Jazan had insufficient knowledge regarding symptomatology, risk factors, diagnosis and complications of non-communicable diseases.*
Keywords: Non-communicable diseases; Risk factors; Diabetes; Hypertension; Heart diseases

I. Introduction

Worldwide, non-communicable diseases are increasingly recognized as a major cause of morbidity and mortality. The World Health Report 2001 had indicated that in 1998, NCDs account for almost 60% of deaths and 43% of the global burden of disease[1].

NCDs emerge as a major public health issue in the Kingdom of Saudi Arabia (KSA) due to an increase in aging population and behavioral changes due to environmental factors[2]. Physically activity is another factor to be considered in KSA. While about half of women are physically inactive and 29% had low levels of physical activity, 23% of men are physically inactive, and the same percentage had low levels of physical activity .

As regard to consumption of servings of fruits or vegetables, only 7.6% of adult population consumed more than five daily servings[3].

Smoking constitutes another problem particularly among men with 21.5% of men are currently smokers and 20.9% of all Saudi males smoke shisha[4].

While diabetes is alarmingly increasing in 2013 in Saudi population with an overall prevalence of 14.8% for males and 11.7% for females, hypertension is one of the NCDs that prevailed with17.7% for males and 12.5% for females in 2013 and was highest among those aged 65 or older (65.2%)[4].

To this end, there is misconception about NCDs and their risk associated factors among young adolescents at schools and assessing their knowledge and attitude about this issue will help in identifying this misconception and putting programs to correct it .

Moreover, the role of schools is to educate children and adolescents about issues such as health, nutrition, hygiene and other healthful life behaviours[5].

II. Material And Methods

Study Design:a cross-sectional study conducted on 15 male secondary schools
Study Location: Jazan city at Jazan governorate, Saudi Arabia.
Study Duration:15th November-15th December, 2015
Sample size: 370
Sample size calculation:
Using EPI info version 7, the study sample size was determined based on the following assumptions:
1) The number of male secondary school students enrolled in Jazan governmental schools during the scholastic year 2015-2016 is 3541 students.
 2) The estimated prevalence of student`s knowledge regarding non-communicable diseases and their risk factors is 50% (This gives the largest sample size).
 3) Tolerable error 5%.
 4) Confidence level = 95%.
Accordingly, a sample size (n) was 347.
This sample was increased to 370 in order to compensate for the possible none-response of some students.

Subjects & selection method:
Inclusion criteria:
All secondary school male students enrolled in Jazan governmental schools during the scholastic year 2015-2016 who were present at schools at the time of data collection (15th November-15th December, 2015) were eligible for study inclusion.
Exclusion criteria:
Only students who were absent at the time of data collection were excluded from the study.
Procedure methodology
▪   **Variables:**
- Independent variables: age, grade, nationality, maternal education and job, paternal education and job and family income.
 - Dependent variable: level of NCDs knowledge (diabetes mellitus (DM), hypertension and heart diseases).
▪   **Sampling technique:**
Two-stage random sampling technique was adopted. In the first stage, two schools were randomly selected through a simple random technique form the total 15. The sample was almost equally distributed between the two schools. In the second stage, within each one of the selected schools, all students in the selected two schools were invited to participate in the study by filling in the study questionnaire. All grades were included till we reached the required sample size.
▪   **Data collection tool and technique:**
Semi-structured self-administered questionnaire was used for data collection. It was developed by the researcher and adopted from other similar studies[6,7,8.]
In its first part the questionnaire contained 8 questions regarding personal characteristics, 20 questions on knowledge of different aspects of common chronic diseases in its second part and five statements to assess students` perception of chronic diseases in its third part. Three-likert scale was utilized for this part (agree, neutral and disagree).
▪   **Scoring system:**
Knowledge questions for hypertension, diabetes and heart diseases were scored as the correct answers were given a score of "1", whereas wrong or don't know answers were given a score of "0". Total knowledge score was computed for each student and the percentage of total knowledge score was obtained. Students who got less than 60% were considered as having "insufficient knowledge", whereas those who had 60% or more of knowledge score were considered as having "sufficient knowledge.

▪   **Pilot study:**

The researcher performed a pilot study on 30 volunteer students from a school other than those selected for the main study in order to examine the instrument's content validity.

Statistical analysis

The data were collected and verified by hand then coded before computerized data entry. The statistical Package for Social Sciences (SPSS) software version 22.0 was used for data entry and analysis. Descriptive statistics and analytic statistics using chi-square test were applied. In order to control for confounding effect, multivariate logistic repression models were adopted. P-values <0.05 was considered as statistically significant.

▪ **Ethical considerations:**

Approval and acceptance paper from the Educational affairs of JPFM- Jazan Region was obtained. Moreover, permission of the headmasters of the involved schools was obtained. A verbal consent was obtained from each participant prior to study conduction and allcollected data were kept confidential.

III. Result

Table no1 summarizes students' personal characteristics. Their age ranged between 15 and 21 years with a mean of 17.3 years and standard deviation of 1.3 years. Mothers of almost one-third of students (31.3%) were illiterate, whereas of 7.8% of them were university graduated. Majority of mothers (93.4%) were house wives. Fathers of 9.6% of students were illiterate, whereas of 22.3% of them were university graduated.

Table no1: Personal characteristics of the participants (n=332)

	Frequency	Percentage
Age in years		
15-17	184	55.4
18-19	134	40.4
>19	14	4.2
Range	15-21	
mean±SD	17.3±1.3	
Maternal education		
Illiterate	104	31.3
Primary school	60	18.1
Intermediate school	68	20.5
Secondary school	74	22.3
University	26	7.8
Paternal education		
Illiterate	32	9.6
Primary school	98	29.5
Intermediate school	52	15.7
Secondary school	76	22.9
University	74	22.3

As demonstrated in table no2, almost three-quarters of the male secondary school students (75.3%) recognized correctly that diabetes mellitus is a NCD, whereas slightly more than half of them recognized that cardiac diseases (60.2%), bronchial asthma (57.2%), cancer (51.8%) and hypertension (51.2%) are NCDs.

Table no2: Recognition of non-communicable diseases by the participants

	Right answer	
	No.	%
Recognition of non-communicable diseases		
-Diabetes mellitus (YES)	250	75.3
-Influenza (NO)	256	77.1
-Hypertension (YES)	170	51.2
-Tonsilitis (NO)	282	84.9
-Cardiac diseases (YES)	200	60.2
-Bronchial asthma (YES)	190	57.2
-Conjunctivitis (NO)	238	71.7
-Cancer (YES)	172	51.8
-Obesity (YES)	144	43.6
-Blindness (YES)	156	47.0

Responses of the students to knowledge questions regarding hypertension are presented in table no3. Obesity was recognized correctly as a risk factor for hypertension by 75.3% of the students. Almost half of the students knew that psychological stress (53%) and smoking (51.2%) are risk factors for hypertension. Overall,

almost two-thirds of the students (66.3%) had insufficient knowledge regarding hypertension diagnostic value, risk factors and symptomatology.

Table no3: Responses of the students to knowledge questions regarding hypertension

	Right answer	
	No.	**%**
Risk factors for hypertension		
-Obesity (YES)	148	75.3
-Underweight (NO)	294	88.6
-Psychological stress (YES)	176	53.0
-High salt intake (YES)	136	41.0
-High fiber consumption (NO)	280	84.3
-Lack of physical exercise (YES)	156	47.0
-Hereditary (YES)	66	19.9
-High fast meals consumption (YES)	86	25.9
-Smoking (YES)	170	51.2
-Aging (YES)	108	32.5
-High blood cholesterol (YES)	98	29.5
-High blood uric acid (NO)	238	71.7
-High tea and coffee consumption (YES)	58	17.5
Normal blood pressure in a healthy adult (80/120 mm/Hg)	**196**	**59.0**

Responses of the students to knowledge questions regarding diabetes mellitus are summarized in table no4. Lack of physical exercise was recognized correctly as a risk factor for diabetes mellitus by 53% of the students. Almost half of the students knew that obesity is a risk factor for diabetes mellitus.
Overall, more than half of the students (55.1%) had insufficient knowledge regarding diabetes mellitus diagnostic value, risk factors, symptomatology and complications.

Table no4: Responses of the students to knowledge questions regarding diabetes mellitus

	Right answer	
	No.	**%**
Risk factors for Diabetes mellitus		
-Obesity (YES)	168	50.6
-Underweight (NO)	300	90.4
-Psychological stress (YES)	94	28.3
-High salt intake (NO)	256	77.1
-High fiber consumption (NO)	264	79.5
-Lack of physical exercise (YES)	176	53.0
-Hereditary (YES)	116	34.9
-High fast meals consumption (YES)	152	45.8
-Smoking (NO)	234	70.5
-Aging (YES)	102	30.7
-High blood cholesterol (YES)	92	27.7
-High blood uric acid (NO)	260	78.3

Responses of the students to knowledge questions regarding heart diseases are summarized in table no5. Smoking was recognized correctly as a risk factor for heart diseases by 56% of the students. Obesity and lack of physical exercise were recognized as risk factors for heart diseases by 45.8% and 42.2% of the students, respectively. Overall, majority of the students (83.1%) had insufficient knowledge regarding heart diseases risk factors. For all studied NCDs, most of the students (76.2%) had insufficient knowledge.

Table no5: Responses of the students to knowledge questions regarding heart diseases

	Right answer	
	No.	%
Risk factors for heart diseases		
-Obesity (YES)	152	45.8
-Underweight (NO)	284	85.5
-Psychological stress (YES)	110	33.1
-High salt intake (YES)	58	17.5
-High fiber consumption (NO)	256	77.1
-Lack of physical exercise (YES)	140	42.2
-Hereditary (YES)	100	30.1
-High fast meals consumption (YES)	82	24.7
-Smoking (YES)	186	56.0
-Aging (YES)	68	29.5
-High blood cholesterol (YES)	78	23.5
-High blood uric acid (NO)	252	75.9

Regarding paternal education, students whose fathers were intermediate school graduated showed the highest rate of sufficient knowledge regarding diabetes mellitus (53.8%), whereas those whose fathers were illiterate showed the lowest rate (31.2%). The difference was statistically significant (p=0.028).

The results of multivariate logistic regression analysis showed that students whose mothers were university graduated were at lower risk for having insufficient knowledge regarding NCDs opposed to those whose mothers were illiterate (AOR was 0.21; 95% CI: 0.06-0.75, p=0.016). Students whose fathers were educated (primary school or more) were less likely to have insufficient NCDs knowledge. Student`s age was not significantly associated with NCDs knowledge.

IV. Discussion

Worldwide and particularly in the Kingdom of Saudi Arabia, there are relatively few studies and limited literature concerning knowledge of non-communicable diseases among the public, particularly among school age group. Abelson[9] stated that health awareness and proper knowledge will protect adolescents from following unhealthy risk styles and behaviors which consequently contribute in preventing NCDs in the community. Therefore, the results of the present school-based study could be of great benefit by providing strategies and recommend areas of school-based health education program.

For all studied NCDs, slightly above three quarters of the students (76.2%) had insufficient knowledge. Contrary to this finding Anju et al.[7] reported that only 34.4% students of RHTC, Singnaudi in Raichur district, Karnataka state of India had no idea that the NCDs were communicable in nature.

The present study revealed that diabetes was recognized as a non-communicable disease by more than 75% of the students. This figure is slightly lower than that reported in a study carried out among Karen ethnic high school students in rural Thasongyang in Thailand[6].

Almost half of the students in the current study recognized lifestyle-related risk factors for heart diseases such as lack of physical exercise and obesity. This was in disagreement with a similar study carried out among school students (11-16 years) in Singnaudi in Raichur district, Karnataka State of India where three quarters of students (76.2%) had low awareness (up to three lifestyle risk factors) and only 3% had good level of knowledge regarding the lifestyle risk factors[7]. The study ofDivakaranet al.[10]had also detected low awareness lifestyle risk factors of NCDs among students where the majority (84.8%) had low awareness and only 0.8% of students were having good knowledge regarding lifestyle risk factors. Other research studies also concluded low awareness about modifiable risk factors such as obesity, physical inactivity in Pune, India[11].

In the current study, 55% of the students had insufficient knowledge regarding diabetes. This is in disagreement with a similar study carried out among high school students in Muscat governorate, Oman were only 24% of male and female students achieved a score of over 50%[12].

In the present study, approximately half of the students could recognize hypertension as a chronic non-communicable disease and 59% of them knew the exact limits of a healthy blood pressure of an adult. Most of them recognized obesity as a risk factor for hypertension. However, less than half of them knew that high salt intake and physical inactivity are risk factors for hypertension. Only one-fifth of them knew that family history is a risk factor for hypertension. These findings were in disagreement with those reported by Shaikhet al.[13]who studied knowledge risk factors of hypertension among the entry year students of a medical university in Pakistan and concluded that most of the students identified psychological stress, obesity, high salt intake, high cholesterol and smoking as risk factors for hypertension.

High consumption of tea and coffee which is traditional in Saudi community was identified as risk factor for hypertension by less than 18% of the students compared to 35.5% in a study carried out by Shaikhet al[13]in Pakistan. In the current study only one-third of the students knew that aging is a risk factor for

hypertension. Comparable result was reported by Shaikhet al.[13]who stated that 60% of the participants did not consider older age as a risk factor.

Majority of the students in the current study had insufficient knowledge regarding heart diseases risk factors and overall knowledge regarding NCDs. Similar results had been reported in other studies carried out in India[14, 15]and Thailand[12].This suboptimal knowledge of the lifestyle-related risk factors which are common to all cardiac diseases necessitates health education lessons regarding cardiac diseases life-style risk factors particularly smoking, physical inactivity and obesity.

Adolescence is the period of life during which youth develop their special behaviors and habits[16]. Therefore, delivering health education in the classroom would be beneficial in helping students to refuse smoking, to not accept unhealthy diet choices such as fast foods as well as to adopt practicing regular physical exercise which will be continue throughout their future life.

The current study revealed that high parental educational level is a protective factor for insufficient knowledge among students regarding non-communicable diseases. This finding is consistent with numerous previous studies[12]. However, the finding of the relationship between family history of non-communicable disease and knowledge of students regarding these diseases was not confirmed in this study in disagreement with other studies that reported the students' level of knowledge was influenced by positive family history of chronic diseases[17].

Students of higher educational grades were more knowledgeable compared to those of first grade after controlling for age which necessitates starting health education of the students regarding NCDs as early as possible.

Study Limitations
One of the limitation of this study was the inclusion of male students only because it was not easy acceptable to collect data from female schools.

V. Conclusion
It can be concluded that most of secondary school male students in Jazan had insufficient knowledge regarding symptomatology, risk factors, diagnosis and complications of non-communicable diseases, namely hypertension, diabetes mellitus and heart diseases. The results of this school-based study could be of great benefit by providing strategies for school-based health education program.

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