OBJECTIVE: To determine the knowledge and attitudes of adolescents in the Eastern Province of Saudi Arabia towards cancer.

METHODOLOGY: A pre-structured tested and revised questionnaire was administered to a randomly selected sample from four high schools (two males and two females) in Dhahran, Saudi Arabia.

RESULTS: Data were obtained from 572 adolescents. There was a marked variability in knowledge across informational items, particularly about the possible causes and how to avoid developing cancer.

CONCLUSION: Students possess some knowledge of cancer, although this knowledge was not uniform. There were misconceptions about cancer and its prevention. The researcher concludes that the development and implementation of school health education programs on cancer are needed in this population.

KEY WORDS: Cancer, Knowledge, Attitude, Saudi Arabia

INTRODUCTION

Cancer is a global disease. It is estimated that it affects at least nine million people every year and around five million patients die of it.¹ Recent studies revealed that cancer has become an ever-increasing problem in Saudi Arabia due to the affluent lifestyle and the increase in life expectancy.² In Saudi Arabia, the incidence of cancer has been

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estimated as around 800 new cases per million population per year,\(^1\) 70% of whom are in an advanced stage. According to the National Cancer Registry of the Ministry of Health, the total number of cases in the year 1994 was 7,028 cases. Males accounted for 3,954 of the cases and the rest were females. The number of Saudis diagnosed with cancer represents almost 72% of the total number of cases reported during that period.\(^7\)

Prevention of cancer is possible and for many types of cancers cure is feasible when detected early. The incidence in the country could be reduced with behavior changes as knowledge improves. Several studies have suggested a severe lack of knowledge among the public about the disease.\(^8\)-\(^12\) Unfortunately, very limited work has been done in Saudi Arabia with public knowledge and attitude towards cancer. A study by Ibrahim et al\(^13\) suggested that general knowledge except about breast cancer is lacking. He reported that education was the most significant factor that influenced individual's misconceptions on cancer in Saudi Arabia. The aim of this study was to assess the level of knowledge and attitudes of secondary school boys and girls in Dhahran, Saudi Arabia.

**SUBJECTS AND METHODS**

The survey was administered to 12\(^{th}\) grade students at the beginning of the academic year 1998-1999, to a randomly selected sample of 572 students from four high schools in Dhahran, Saudi Arabia, two males and two females.

A three part prestructured, tested and revised questionnaire consisting of 22 questions was developed. Part one included 15 true/false items to evaluate students' knowledge of cancer. Part two included five questions, eliciting information on students' attitudes and the need for instruction on cancer to be included in the school curricula. Part three of the questionnaire consisted of two open-ended questions namely: (1) "What would you like to know about cancer," and (2) "What are the eating habits that reduce the risk of developing cancer?"

The survey which was administered by the teachers to all 12\(^{th}\) grade students who were present took approximately 20 minutes to complete. Students were told that the questionnaire was designed to find out how much they knew about cancer and that their answers would be used to develop cancer education materials for high school students in Saudi Arabia. Internal reliability of the questionnaire was calculated using Cronbach's alpha.

A copy form was developed to reflect the range of responses to each question. Each response mentioned was recorded. Students could and often did mention more than one response for a particular question. Questions left unanswered were considered missing. Actual comments and the coded data were analyzed using SPSS (Statistical Package for Social Sciences). Statistical analysis included frequency distribution for each variable. The total score of knowledge was computed. Students' t-test was computed to identify the effect of gender and different attitudinal variables on knowledge.

**RESULTS**

The alpha coefficient was found to be 0.84. Table 1 shows that students possess some knowledge of cancer, although this knowledge was not consistent. The majority of responses (83%) stated that cancer was a life threatening disease, and 55% indicated cancer as uncontrolled growth of cells. Other responses indicated that everyone was susceptible to cancer (62%). On the causes of cancer, 93% of the students correctly indicated that smoking was one of the causes. Continuous exposure to environmental
Table 1: Subject's correct responses for each knowledge statement by sex

| STATEMENT | TOTAL | MALE | FEMALE |
|-----------|-------|------|--------|
| Cancer is uncontrolled growth of cells of the body | 331 | 165 | 148 |
| Cancer is caused by virus | 263 | 111 | 152 |
| The cause of cancer is unknown | 189 | 83 | 106 |
| Anybody is susceptible to cancer | 353 | 192 | 161 |
| Cancer is not a life threatening disease | 476 | 244 | 232 |
| Early detection of cancer is difficult because there are no specific symptoms. | 362 | 183 | 179 |
| Cancer is an infectious disease | 426 | 208 | 218 |
| Smoking can cause cancer | 534 | 274 | 260 |
| Any sun-exposure or ultra violet rays can cause cancer | 161 | 85 | 76 |
| Continuous exposure to environmental hazards can cause cancer | 311 | 173 | 138 |
| Alcohol addiction can cause cancer | 368 | 159 | 209 |
| A balanced diet reduces the possibility of getting cancer | 331 | 168 | 163 |
| Regular health check-up helps detect cancer early | 481 | 241 | 240 |
| Self breast examination is the best way to detect cancer early | 418 | 186 | 232 |
| Regular exercise reduces the chances of getting cancer | 347 | 201 | 146 |

Total Mean Score | 570 | 9.3 | 286 | 9.3 | 284 | 9.3

*p < 0.001; †p < 0.05; ‡p < 0.01

Table 2: Subject's attitudes towards cancer by sex.

| STATEMENT | SEX | YES | NO | p-VALUE |
|-----------|-----|-----|----|---------|
| I am afraid of developing cancer | M | 231 | 44 | 16.0 | 0.00 |
| | F | 256 | 15 | 5.5 |
| I would rather get any other diseases than cancer | M | 95 | 111 | 53.9 | 0.00 |
| | F | 155 | 63 | 28.9 |
| I have heard enough about cancer and I don't want to hear anymore about it | M | 62 | 218 | 77.6 | 0.03 |
| | F | 83 | 200 | 70.7 |
| It is important that students learnt about cancer in the school | M | 261 | 19 | 6.8 | NS |
| | F | 259 | 21 | 7.5 |
| The media is the best source for cancer information | M | 240 | 35 | 12.7 | NS |
| | F | 253 | 28 | 10.0 |

NS = Not significant
hazards was indicated by 54%, alcohol addiction by 64% and an unbalanced diet by 38% of the surveyed population. The adolescents were well informed on cancer detection. About 84% indicated that regular health-checks help in the early detection of cancer. Table 1 shows that there were significant differences among the males and females in relation to the eight statements particularly on the statements that cancer was caused by virus, everyone was susceptible to cancer and that smoking could cause cancer. This table also shows that there was no significant difference in total score of knowledge with respect to sex.

It is evident from Table 2, that adolescents' attitude about cancer showed fear, 89.2 percent of the respondents reported "being afraid of developing cancer" and 74.2 percent reported that they "have not heard enough about it". A majority of the adolescents (58.2%) surveyed indicated that they would rather contract any disease other than cancer. Most of those surveyed, 95.9% indicated it was important for students to have some education on cancer at school. Also, it was found there was a significant difference between male and female adolescents on the three statements: "I am afraid of developing cancer", "I'd rather get any disease other than cancer," and "I have heard enough about cancer and I don't want to hear anymore about it".

Figure 1 shows responses to what you would like to know about cancer. The majority of the students (66%) wanted to have more information about cancer. Most of the students wanted general information (e.g. types of cancer, whether prevention was possible for all types of cancer and how), information about symptoms (how to find out if one has it whether it was painful, what the specific symptoms were). Girls were more concerned than boys to talk about cancer symptoms. Types of treatments were mentioned almost equally by both sexes (28%). Some of the students (12%) were interested to know the effects of cancer (what it does to the body, whether it leaves scars in your body, whether it deforms).

Figure 1:

Response to question "What would you like to know about cancer?"
Figure 2: Response to question: "What eating habits should you follow to reduce the risk of getting cancer?"

Figure 2 indicates responses to the eating habits. What eating habits to follow to reduce the risk of developing cancer? The general responses mentioned by 27% of students were eating the basic four groups, quality food, and balanced meal. Lots of vegetables and low fat were mentioned by 20% and 14% respectively. Specific recommendations about cholesterol were mentioned by 5% of the students. One third (35%) stated "don’t know" or left the question unanswered.

Other eating practices, including a wide variety of responses, were mentioned by 25% of students. Other examples include, “eating protein rich food, wash hands before eating, cook all meat,” and avoiding certain food (e.g. fast food, all restaurant food, high carbohydrates and all red meats).

DISCUSSION
The focus of this study is on knowledge and attitudes towards cancer among Saudi high school students. The rationale behind the survey was that the lack of public knowledge about cancer, particularly about the importance of early detection was a potential barrier that prevent people from participating in cancer control activities.14 However, other studies have pointed out that other factors such as easy access to screening programs and other social and psychological factors are important in changing behaviour.10 The total mean knowledge score was 9.3 (60%) which indicates a reasonable general knowledge in comparison to another study conducted elsewhere in Saudi Arabia.13 However, students' knowledge on certain questions on cancer such as the causes and prevention of cancer was poor.

Students in the present study sample consider cancer as a life threatening disease, but knew little about causes and prevention of the disease. Since the awareness of the seriousness of a disease can influence patterns of behaviour, this can be used in health education programs as a means of guiding choices and effecting change in behaviour.73 Fifty four percent indicated environmental hazards, 64% alcohol addiction as causes but 39% of the students were unable to understand that everyone was susceptible to cancer. The health belief model proposed that

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perceived susceptibility is an essential predictor of likelihood for adopting healthy behaviour.\cite{16}

It was evident that students' knowledge of cancer was generally low since an average of 60% of the students gave correct responses to the general questions on cancer. They did not know what the risk factors were and had little knowledge on its prevention. Besides, 66% of the students indicated a need for more information about the disease. Gender was not a factor in total score on the knowledge on cancer though there were significant differences in the answers to certain items on the questionnaire. For instance, more girls knew about breast cancer detection, and alcohol as a risk factor while more boys stated that smoking was a risk factor and exercise was a preventive factor. This could be explained by the educational drive on breast cancer prevention currently being conducted among women. On the other hand, the boys had more knowledge about smoking, regular exercise and its relation to cancer prevention. This difference in knowledge between the sexes could obviously be explained by the differences in public health education programs. It is also indicative of the lack of appropriately structured information/education for students. It is important for this section of the society to be given proper information about cancer and its prevention.

The findings indicate the need for a teaching module to be included in the school curricula to deal with misconceptions about cancer and cancer prevention. Schools are a valuable asset in health education\cite{17} and cancer education is no exception. Accurate knowledge and information could encourage young people to adopt behaviour patterns that would reduce the risk of cancer.\cite{18} Various studies have suggested that educating young people on cancer can affect their attitude to the diseases.\cite{19} Gribb\cite{20} and Resnicow et al\cite{21} pointed out that curricula that foster a positive attitude towards cancer prevention include information and skill-building on how to make informed decisions about health. Increasing people's knowledge about cancer is an important strategy in influencing their decisions about whether or not they participate in cancer preventive practices. It must be recognized, however, that the school represents only part of the students' educational experience. Parental involvement has an important role to play particularly in the area of diet.\cite{22} Similar to data reported for other western students, relatively few students were aware of the association between diet and cancer and the specific dietary recommendations that to reduce the risk of cancer.\cite{23,24} There is a need for a joint effort between the agents that influence students' social behaviour to foster the making of healthy choices in such complex social behaviour as smoking and eating habits.\cite{25,26} Much of the behaviour recommended to reduce the risk of cancer require the making of lifelong healthy decisions early.\cite{27} The role of the mass media in raising public awareness about cancer cannot be overemphasized. Special cancer education programs should be directed to adolescents and the youth.

As the incidence of cancer in Saudi Arabia continues to escalate,\cite{2,4} more attention must be directed at adolescent population, if the burden of chronic illness (cancer) among Saudis is to be lightened.

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