

Level of Awareness about Parasitic Diseases among Students, Jeddah, Saudi Arabia

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Abstract. The degree of awareness about parasitic diseases among intermediate, secondary, and university students was investigated. Three thousand and two hundred male and female students at different levels of studies from the city of Jeddah, Saudi Arabia were asked to fill a questionnaire to estimate their degree of awareness about parasites and parasitic infections. Students studying in faculties related to the medical field were excluded. Questionnaires were analyzed and the mean level of awareness about parasites and parasitic infections among students was 2.9 (± 1.4) of 6. Nationality, age, level of study, family income, and previous exposure to intestinal parasites had a statistically significant influence on awareness about parasitic disease ($p < 0.01$). In conclusion, there is a below average level of awareness about parasites and parasitic diseases among students. Inoculating more information about parasites and parasitic diseases in school curricula will help in increasing the awareness level. The media can also be used more efficiently to provide more information and increase the level of awareness.

Keywords: Parasite, Awareness, Parasitic diseases.

Introduction

Parasitology is the science that deals with the interactions between a host and a parasite that lives on or inside that host^[1].

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Parasitism always involves two organisms (parasite and host). Many of these parasitic associations produce pathological changes in hosts that may result in disease. Successful treatment and control of parasitic infections requires not only comprehensive information about the parasite itself but also a good understanding of the nature of parasites' interactions with their hosts^[2].

Many factors may contribute to transmission of parasites. These include inadequate sanitation and poor hygienic living conditions which, in turn, may lead to fecal contamination of the environment, lack of health education, contaminated water supplies, and failure to control vectors.

Health education in schools and primary health centers are a major leap in controlling parasitic infections. Furthermore, increasing awareness regarding parasitic infection among school children is a major tool in controlling and avoiding parasitic infections^[3].

Even though parasites account for a major fraction of the biological diversity on the human, few studies have analyzed the factors affecting the spatial distribution of these organisms or attempted to quantify their contribution to biodiversity^[4].

A literature search of the past 20 years has not revealed any study concerning the awareness of parasitic infections among students in Jeddah or in other Saudi Arabian cities. A study evaluating awareness about parasitic infection in boys and girls in Nepal revealed that higher levels of awareness were seen in previously infected individuals^[5].

The aim of this study was to estimate the level of awareness among intermediate, secondary school, and university students, as well as to explore the effect of different factors on the level of awareness.

Materials and Methods

Sample Selection

Second year male and female students from intermediate, secondary schools and King Abdulaziz University (KAU) were randomly selected. University students from faculties related to health sciences were excluded due to their background knowledge of parasitic infections.

For intermediate and secondary schools, the map of the city of Jeddah was used to divide the city into six areas. One intermediate and one secondary school were selected from each area. One hundred questionnaires were distributed to each school and eight hundred questionnaires were distributed to university students.

Data Collection

A questionnaire was designed to estimate the degree of awareness about parasitic diseases among students and the effect of different factors on the degree of awareness (Table 1).

The questionnaires were constructed of five main sections; under each section were various subdivisions to enquire about different types of data. The subdivisions included demography, economic factors, education, general knowledge and awareness data. Questionnaires were coded with unique numbers. These numbers were used to identify the location and level of schools. Questionnaires were filled under direct supervision of the researcher.

For each school, 100 questionnaires were submitted. A total of 2,400 questionnaires were filled by school students and 800 questionnaires were filled by university students.

Data Analysis and Statistics

Data was fed into a Microsoft Excel table which was used to construct tables and figures. The Statistical Package for Social Sciences (SPSS), version 10.01 program was then used to form all the statistical analysis.

Results

This study was designed to estimate the level of awareness about parasitic diseases among intermediate and secondary school students, as well as university students. The effects of different factors affecting this level of awareness were also explored.

Three thousand and two hundred (1,500 males and 1,700 females) students answered the questionnaire. Of the studied group, 2,232 (69.75%) were Saudis and 968 (30.25%) were non-Saudi. Their age

Table 1. Questionnaire to evaluate the degree of awareness about parasitic infections among students and the effect of different factors on awareness.

Demographic Data	Name	Age:	Sex:	<input type="checkbox"/> Male	<input type="checkbox"/> Female				
Economic Factor	School/Faculty:								
	Type of accommodation:	<input type="checkbox"/> Rural house	<input type="checkbox"/> Flat	<input type="checkbox"/> Villa					
		<input type="checkbox"/> Rent	<input type="checkbox"/> Own						
	Family monthly income	<input type="checkbox"/> 1-2000		<input type="checkbox"/> 2001-5000	<input type="checkbox"/> 5001-10,000				
		<input type="checkbox"/> >10,000							
Educational Factor	Education	Father	<input type="checkbox"/> Literate	<input type="checkbox"/> Primary	<input type="checkbox"/> Intermediate	<input type="checkbox"/> Secondary	<input type="checkbox"/> University	<input type="checkbox"/> Masters	<input type="checkbox"/> Doctorate
		Mother	<input type="checkbox"/> Literate	<input type="checkbox"/> Primary	<input type="checkbox"/> Intermediate	<input type="checkbox"/> Secondary	<input type="checkbox"/> University	<input type="checkbox"/> Masters	<input type="checkbox"/> Doctorate
Educational Factor	Job	Father	<input type="checkbox"/> Unemployed	<input type="checkbox"/> Government employee	<input type="checkbox"/> Private employee	<input type="checkbox"/> Business			
		Mother	<input type="checkbox"/> Unemployed	<input type="checkbox"/> Government employee	<input type="checkbox"/> Private employee	<input type="checkbox"/> Business			
General Knowledge Factor	Do you and your family read newspapers and magazines regularly?								
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
General Knowledge Factor	Do you have a television and a satellite receiver at home?								
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
General Knowledge Factor	Have you or any of your family been previously infected with the pin worm?								
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
General Knowledge Factor	Have you or any of your family previously been infected with intestinal parasites?								
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
				<input type="checkbox"/> Yes	<input type="checkbox"/> No				
Awareness Factor	Vaccines protect us against:								
				<input type="checkbox"/> Parasitic Disease	<input type="checkbox"/> Viral and Bacterial Diseases	<input type="checkbox"/> All Diseases			
				<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Flu	<input type="checkbox"/> Cough			
				<input type="checkbox"/> Bacteria	<input type="checkbox"/> Parasite				
Awareness Factor	Which of the following is caused by a parasite?								
				<input type="checkbox"/> Infected Food	<input type="checkbox"/> Mosquito Bite	<input type="checkbox"/> Air			
				<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Skin rash	<input type="checkbox"/> Joint Pain			
				<input type="checkbox"/> Parasite	<input type="checkbox"/> Bacteria	<input type="checkbox"/> Virus			
Awareness Factor	Malaria can be transmitted through								
				<input type="checkbox"/> Infected Food	<input type="checkbox"/> Mosquito Bite	<input type="checkbox"/> Air			
				<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Skin rash	<input type="checkbox"/> Joint Pain			
				<input type="checkbox"/> Parasite	<input type="checkbox"/> Bacteria	<input type="checkbox"/> Virus			
Awareness Factor	Ancylostoma can cause:								
				<input type="checkbox"/> Diarrhea	<input type="checkbox"/> Skin rash	<input type="checkbox"/> Joint Pain			
				<input type="checkbox"/> Parasite	<input type="checkbox"/> Bacteria	<input type="checkbox"/> Virus			
				<input type="checkbox"/> Parasite	<input type="checkbox"/> Bacteria	<input type="checkbox"/> Virus			

distribution (Fig.1) was ranged from 12-38 with a mean value of 17 (± 3.6). The level of students' awareness about parasitic infection was calculated based on their answers to six questions (Fig.2). Regarding living residence, 1,526 (47.7%) lived in rented houses and 1,674 (52.3%) in owned houses. Three hundred and twenty-nine (10.3%) students lived in rural houses, 2,145 (67%) lived in apartments, and 724 (22.7%) lived in villas. The family income of participating students was variable (Fig. 3). Parents' level of education and work were also explored (Fig. 4 and 5). About 75.7% of students' families follow-up newspapers and/or magazines regularly, and 95.5% of them follow TV programs.

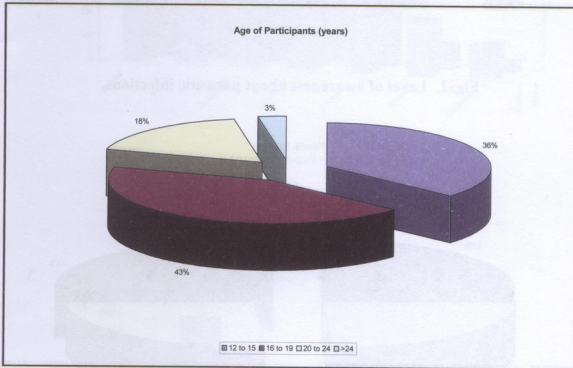


Fig. 1. Age distribution of students.

The knowledge factor was calculated on the basis of each student's answer to different questions about following up newspapers / television and previous infections with parasites. About 23.8% (762) of the studied group did not follow up newspapers and magazines regularly and 4.5% (144) did not watch television. Fifty-seven (1.8%) students were previously infected with pin worm, 249 (7.8%) with intestinal parasites, and 139 (4.3%) with malaria.

Statistical analyses were applied to evaluate the effect of different factors on the level of awareness about parasitic infections among students.

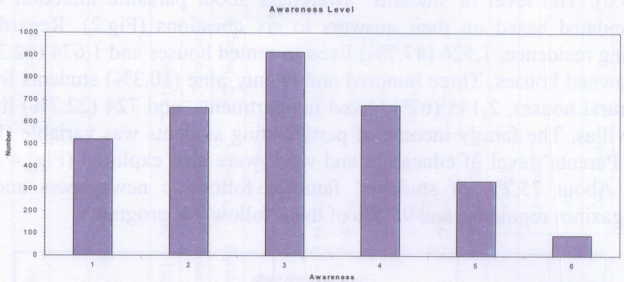


Fig. 2. Level of awareness about parasitic infections.

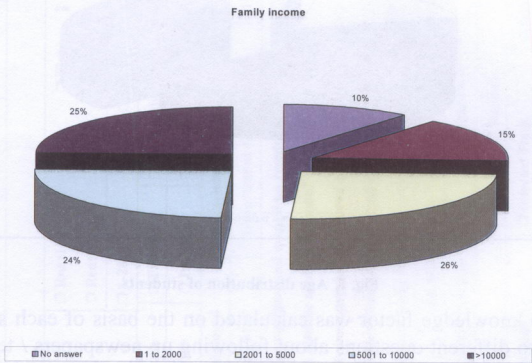


Fig. 3. Family income.

There was a strong correlation ($p < 0.01$) between the level of awareness about parasitic infections and the nationality, age, level of study, family income, and previous exposure to intestinal parasites.

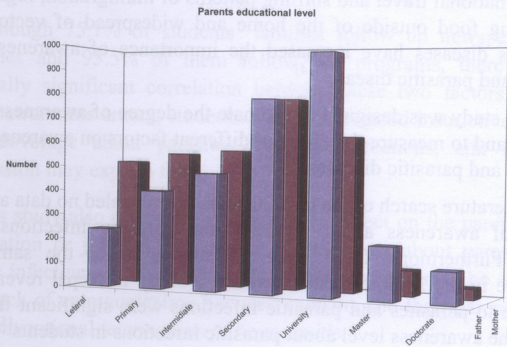


Fig. 4. Parents' level of education.

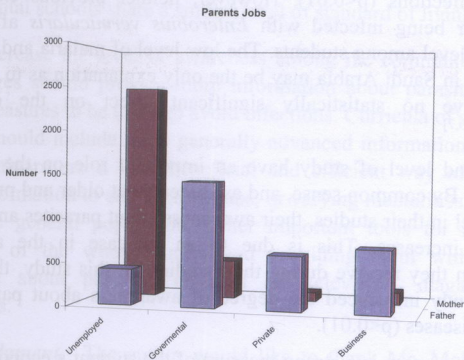


Fig. 5. Parents' job.

Discussion

International travel and shifting patterns of immigration, high rate of consuming food outside of the home and widespread of vector borne infectious diseases have increased the importance of awareness about parasite and parasitic disease^[3, 4].

This study was designed to estimate the degree of awareness among students and to measure the effect of different factors on awareness about parasites and parasitic diseases.

A literature search of the past 20 years has revealed no data about the degree of awareness about parasites and parasitic infections among Saudis. Furthermore, there were no studies about the same issue anywhere in the Middle East. However, a study in Nepal revealed that exposure to parasites and parasitic infections were significant factors in raising the awareness level about parasitic infections in students^[5].

In this study, two thirds of the study group had a below average degree of awareness about parasites and parasitic diseases. Previous exposure to intestinal parasites significantly increases awareness about parasitic infections ($p < 0.01$). However, neither previous exposure to malaria nor being infected with *Enterobius vermicularis* affected the awareness level among students. The low level of malaria and pin worm prevalence in Saudi Arabia may be the only explanation as to why these factors have no statistically significant effect on the degree of awareness^[6,7].

Age and level of study have an important role on the degree of awareness. By common sense, and as students get older and proceed to a higher level in their studies, their awareness about parasites and parasitic infections increases. This is due to an increase in the amount of information they receive during their studies. In this study, the age and level of study influenced the degree of awareness about parasites and parasitic diseases ($p < 0.01$).

Family income is a strong measure of the student's economic status. This study revealed that students who lived in families with a higher income are more aware about parasites and parasitic infections. As the income increases, families become more exposed to information about

healthy food and methods of disease transmission. This in turn, may increase their level of awareness about parasites and parasitic infections.

Although 75.7% of students' families follow up newspapers and magazines and 95.5% of them follow TV programs, there was no statistically significant correlation between these two factors and the level of awareness among students. The lack of good instructive TV and media coverage about parasites, parasitic infections, and mode of transmission may explain this.

This study also revealed that there is no effect on the parents' level of education or jobs on the degree of awareness about parasites and parasitic infections. Such results were unexpected and may be explained by the lack of communication between students and their parents due to the unconventional intervention of housemaids.

In addition, the type of residence and ownership of living residence of students have no effect on the level of awareness. This may be explained by the fact that most students living in Jeddah who attend governmental schools share a similar level of standard of living.

To increase the level of awareness among the community, schools and colleges should provide more information about parasitic diseases and the measures to be taken to avoid infections. Curricula of schools and colleges should include more generally advanced information about this issue. Seminars are a very beneficial and efficient way of providing correct information to any ages, groups, or varying mentalities, and it can be for the general population. Other important tools for raising the awareness of the whole family and providing them with essential knowledge about parasitic diseases are television, magazines and newspapers.

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درجة الوعي عن الأمراض الطفيلية لدى طلاب المدارس بجدة، المملكة العربية السعودية

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المستخلص. هدفت هذه الدراسة الى تقدير درجة الوعي بين طلاب المدارس والجامعات للأمراض الطفيلية. وقد تمت دراسة ثلاثة آلاف ومائتي طالب وطالبة من مدينة جدة، عن طريق تعبئة استبيان لتحديد درجة معرفتهم بالطفيليات والأمراض الطفيلية. وتم استبعاد الطلبة الذين يدرسون في المجالات الطبية. وقد وجد أن معدل درجة المعرفة بالطفيليات والأمراض الطفيلية لدى الطلاب كان ٢,٩ من ٦,٠ ($1,٤ \pm$). والعوامل التي أدت إلى ارتفاع درجة المعرفة، هي الجنسية، والعمر، والمرحلة الدراسية، ودخل الأسرة، والتعرض المسبق للديدان المعوية. وعليه فإن درجة المعرفة بالطفيليات والديدان الطفيلية كان دون المتوسط. ولذلك فإن إدراج بعض المعلومات عن الطفيليات والأمراض الطفيلية ضمن المناهج الدراسية سوف يزيد من درجة المعرفة. يضاف إلى ذلك استغلال أجهزة الإعلام بشكل أفضل لرفع درجة المعرفة.