Assessment of students' knowledge about environmental health in College of Health and Medical Technology: A Cross-Sectional study

تقييم معارف الطلبة حول صحة البيئة في كلية التقنيات الصحية والطبية : دراسة مقارنة

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المستخلص:

الهدف : الهدف من الدراسة هو تحديد مستوى معرفة الطلبة حول صحة البيئة .

المنهجية: دراسة مقطعية أجريت في كلية التقنيات الصحية والطبية في مدينة بغداد خلال الفترة من ١مارس ولغاية ١ يوليو ٢٠١٢وقد تم جمع البيانات عن طريق التسجيل الذاتي للاستبيان الذي صمم مسبقا للحصول على المعلومات الاجتماعية والديمغرافية مثل (العمر،الجنس، القسم ، سنة الدراسة).

النتائج: أعلى نسبة للطلبة كانوا في المرحلة الثانية و يليها المرحلة الثالثة وكانت اعلى معدلات الطلبة هم الذين لديهم اقل مستوى معرفي ويتبع ب المستوى المعرفي المتوسط ، بينما اقل معدل للطلبة من ذوي المستوى المعرفي العاليالفتيات هم اعلى مستوى معرفي مقارنة مع الذكورالذين هم مستواهم المعرفي متوسط . الطلبة من قسم التحليلات المرضية بلغوا اعلى مستوى معرفي يليهم طلبة قسم التخدير واقل مستوى معرفي كانت في قسم العلاج الطبيعي .

وجود فرق معنوي ما بين انخفاض مستوى المعرفة في السنة الاولى (٥٧,٧٪) والسنة الثانية (٥٠,٧٪)،بينما كانت اعلى نسب للمعرفة بشكل رئيسي لطلبة المرحلة الرابعة (٩,٨٪) و متوسط مستوى للمعرفة في السنة الثالثة حيث بلغت نسبتها (٥٣,٣٪) تليها السنة الرابعة بنسبة ٥٠٪.

التوصيات: كل اقسام الكلية يجب ان يدرس فيها مادة صحة البيئة لما لها من اهمية وليس فقط قصرا على طلبة قسم صحة المجتمع.

Abstract:

Objective: the aim of this study is to determine the level of students' knowledge about the environmental health.

Methodology: The cross-sectional study was conducted at the College of Health and Medical Technology in Baghdad city during the period from 1st march till 1st of July 2012. Data was collected by self-recording of a previously designed questionnaire to obtain socio-demographic information such as (age, gender, department, year of grade).

Results: The highest rate of students were in the 2nd year followed by the 3rd year, highest rate of students had low level of knowledge followed by intermediate level of knowledge, while lowest rate of students on had high level of knowledge .Females had higher level of knowledge compared to males who had intermediate Level of knowledge; Students of pathological analysis department had high level of knowledge among other students, followed by students of anesthesia department. The lowest rate was among department the physiotherapy. A significant association between that low level of knowledge was among 1st (57.7%) and 2nd (50.7%) year students mainly , while high level of knowledge was mainly among 4th year (9.8%), and the intermediate level of knowledge was among 3rd year students in a rate of (53.3%) and 4th year in a rate of 50%.

Recommendations: Include all the department of the college in environment health lectures as the issue is important for all student and not only the community health students.

Key words: Assessment, Students, Environmental health, Knowledge.

Introduction:

Environmental Education (EE) has been defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as "a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action" [(1)]. The Decade of Education for Sustainable Development (DESD, 2005-2014) was proclaimed by the General Assembly of the United Nations in December 2002 in resolution 57/254. The basic vision of the Decade is a world where everyone has the opportunity to benefit from education and learn the values, behaviors and lifestyles required for a sustainable future. Education for sustainable development addresses the issues of natural resources (water, energy, agriculture, housing, biodiversity, etc) and develops the understanding of the interdependence and fragility of the Earth systems. This will enable learners to adopt new behaviors in the protection and use of natural resources, which are essential for human development and survival [(2)]. In recent years, environmental sensitivity has been centered in the domain of environmental education by environment specialists and it has been used within a sense of emphatic perspective into the environment [(3)]. A large topic of interest within the environmental education realm is establishing how personal traits or lifestyle factors contribute to a person's environmental attitudes and behaviors. A general attitude can be defined as something which "must be perceived by the individual as connected in some meaningful way to a specific situation to serve as a basis for an evaluative reaction in that situation [(4)]. Knowledge is commonly seen as a necessary precondition for a person's behavior. Consistent with this, most educational interventions rely on knowledge transfer. However, for the most efficient informational strategies for education, it is essential that we identify the types of knowledge that promote behavior effectively and investigate their structure [(5)]. Student's environmental awareness is one of the most important indicators for displaying national civilization. It reflects many aspects of environmental status, such as personal consideration and behavior, public capacity, and the local citizens, attitude towards sustainable society as a whole, [(6)]. An understanding of the nature of environmental problems thereby is fundamental for any approach to addressing their solutions and this necessitates the documentation of our students' present level of environmental consciousness and understanding of related concepts [(7)]. Thus, this paper discusses the findings of a survey on university students' level of environmental attitudes, behaviors and knowledge and its implications for education in the light of sustainable development [(7)].the aim of this study to identify environment health knowledge of student.

Methodology:

The study design was cross – sectional one, conducted in College of health and medical technology, for the period from 1st march till 1st of July 2012. The sampling method was stratified random sampling. And thus sample size was (807).

Data collection was by self-recording of a previously designed questionnaire that consisted of several Components, namely demographic background and Knowledge; which tested the knowledge of the students regarding some environmental topics such as definition of the environment, global environmental problems, water pollution, air pollution, solid waste and energy. These topics were tested through 25 multiple choice questions, the source and Frequency of exposure of students to environmental information outside school or college.

Each question was allowing for one correct answer only. A score was calculated for every student. Scores were found to range between 8/25 and 22/25. A score of ≤ 69% was considered poor, 70-80% was considered moderate and a score of 81% or more was considered good. Then rate of poor and moderate and high percentages were calculated and students' knowledge was classified accordingly.

Data were analyzed using descriptive statistics (frequencies and percentages), and analytic statistics (chi-square test for association between two variables with results being considered as statistically significant when the p value was < 0.05.

Results:

Table 1. Distribution of students' characteristics (No. 807)

Characteristic of sample	Frequency	Percentage
Gender		
Male	**360**	**44.6**
Female	**447**	**55.4**
Grades		
1st year	**182**	**22.6**
2nd year	**219**	**27.1**
3rd year	**212**	**26.3**
4th year	**194**	**24**
Department		
Technical Pathological analysis	**161**	**20**
Technical Dentist	**74**	**9.2**
Technical x- ray	**134**	**16.6**
Technical Ophthalmology	**96**	**11.9**
Technical Anesthesia	**108**	**13.4**
Technical Physiotherapy	**81**	**10**
Technical Community health	**153**	**19**

No: sample size

Females constituted 55.4% of the sample as shown in **table 1**, the highest rate of students were in the 2nd year (27.1%) followed by the 3rd year in a rate of (26.3%). 20% of students were from the department of technical pathological analysis and 19% from the technical community health department, the lowest rate was the technical dentist department (9.2%).

Table 2. Distribution of students according to their knowledge

Level of knowlege	Frequency	Percent
Poor	**395**	**49**
Fair	**372**	**46**
Good	**40**	**5**
Total	**807**	**100**

Table 2 shows that the highest rate of students had low level of knowledge (49%) followed by a rate of 46% for intermediate level of knowledge and only 5% of students on had high level of knowledge.

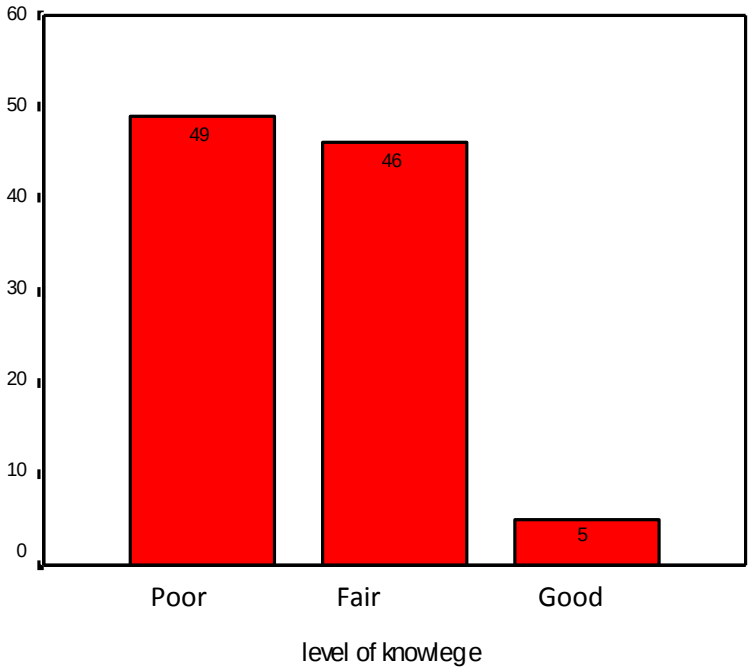

Figure 1. Level of knowledge for students

Table 3. Rate of respondents with correct answer for knowledge of certain issues on environmental health

Type of knowledge question	Rate of correct answers
Natural environment	**90.4**
Environmental pollutants	**52.4**
Greenhouse gases	**17.7**
Ozone depletion	**54.2**
Desertification	**4.7**
Solid waste disposal	**40.1**
Air pollutant	**85.4**
Global warming	**39.14**
Loss of natural Resources	**27.15**
Recycling of waste material	**37.7**

Table 3 shows that students had high score of knowledge about questions related to natural environment (90. 4%) followed by knowledge about air pollutants (85.4%) while only 4.7% knew what desertification means.

Table 4. Relationship between students' knowledge and gender

Gender	Level of knowledge			Total	P value
	Poor	Fair	Good		
Male	**184** **51.1%**	**160** **44.4%**	**16** **4.4%**	**360** **100%**	χ^2**= 2.043** **p≤0.509** **N.S**
Female	**206** **46.1%**	**212** **47.4%**	**24** **5.4%**	**447** **100%**	
Total	**383** **47.5%**	**372** **46.1%**	**40** **5%**	**807** **100%**	

%= percent, P= probability level, N.S= No significant

Females had higher level of knowledge as shown in table 4 as the rate for intermediate and high level was 47.4% and 5.4% respectively as compared to males who had a rate of 44.4% for intermediate Level of knowledge and a rate of 4.4% for high level. The result was statistically not significant as P value was more than 0.05.

Table 5. Relationship between students' knowledge and class

Class	Level of knowledge			Total	p- value
	Poor	Fair	Good		
1st	105 57.7%	66 36.3%	1 .5%	182 100%	
2nd	111 50.7%	96 43.8%	12 5.5%	219 100%	χ^2= 57.79 p≤0.000 H.S
3rd	90 42.5%	113 53.3%	8 3.8%	212 100%	
4th	77 39.7%	97 50%	19 9.8%	194 100%	
Total	383 47.5%	372 46.1%	40 5%	807 100%	

%= percent, χ^2= chi-squared test, P= probability level, H.S= highly significant

Table 5 shows that low level of knowledge was among 1st (57.7%) and 2nd (50.7%) year students mainly while high level of knowledge was mainly among 4th year (9.8%), and the intermediate level of knowledge was among 3rd year students in a rate of 53.3%) and 4th year in a rate of 50%. The result is statistically highly significant as p value was less than 0.05.

Table 6. Relationship between of students' knowledge and type of study

Department	Level of knowledge			Total	p- value
	Poor	Fair	Good		
Technical pathological analysis	88 54.7%	48 29.8%	25 15.5 %	161 100%	
Technical dentist	51 68.9%	22 29.7%	1 1.4%	47 100%	χ^2= 149.1 p≤0.000 H.S
Technical x- ray	59 61.5%	78 58.2%	2 1.5%	134 100%	
Technical ophthalmology	59 61.5%	36 37.5%	1 1%	96 100%	
Technical Anesthesia	38 35.2%	65 60.2%	5 4.6%	108 100%	
Technical physiotherapy	56 69.1%	25 30.9%	0	81 100%	
Technical community health	49 32%	98 64.1%	6 3.9%	153 100%	
Total	395 48.9%	372 46.5%	40 5%	807 100%	

%= percent, χ^2= chi-squared test, P= probability level, H.S= highly significant

Table 6 shows that students of technical pathological analysis department had high level of knowledge in a rate of 15.5% which is the highest among other students, followed by students of technical anesthesia in a rate of 4.5%. The lowest rate was among department of technical physiotherapy 0% .The result is statistically highly significant as p value was less than 0.05.

Discussion:

The characteristic of sample reflects distribution of students in the college of health and medical technology according to departments as the technical laboratory analysis department is the largest in terms of number of students followed by the technical community health department. Our current study, the students' written responses to closed ended questions revealed varying degrees of knowledge concerning environmental health issues. In terms of students' baseline knowledge, results showed that in general, students have more knowledge about more general older environmental topics (Environmental Issues) than the specific topics or terminologies, as for constituent of natural environment 90.4% answered correctly, also causes of air pollution was known to 85.4% of students, The results were consistent with the findings of a world-wide study which showed that the level of knowledge on environmental issues among surveyed undergraduates was not satisfactory and there was a large knowledge gap on almost every aspect from environmental tools and technologies[7]and 78.3% of Italian population were aware that outdoor air pollution was associated with increase daily mortality from respiratory diseases [8] . The greenhouse effect that is produced by industry and agriculture and is believed to have a major role in global warming[9]was known to 17.7% of students in the current study only while students of Malaysia had higher rate of knowledge about this issue amounting to 82%[10]and in Italy the rate was 78.9%[8]. The causes of ozone depletion were known to 54.2% of students in the study sample, which is similar to results of a study in China that 55.8% of students knew chlorofluorocarbon emissions from refrigerators was the main cause for ozone depletion [11] and so was most first year medical students in Ankara[12]. Recent issue like global warming was known for only 39.14% of students and desertification which is an important problem nowadays is known for only 4.7% of students a rate close to that of medical students in Ankara [11]. Comparing these results with those of a study in America, it was found that 14% of their population were alarmed about the effect of global warming and 31% were every concerned that greenhouse gases in the atmosphere affect the average global temperature [13] and the Malaysian population recognized the fact that deforestation will cause biological imbalance in a rate of 53%[14].

Management of solid waste reduces or eliminates adverse impacts on the environment and human health and supports economic development and improved quality of life. Knowledge about solid waste and its management was known to 40.1% of students in the current study, this result was similar to that of a study in Iran among students of medical Sciences whose rate of knowledge about this issue was 44% [15] . Resource recovery offers alternative to waste management but recycling was known to only 37.7% of them, the result is low compared to that of poor people in Malaysia who had an adequate knowledge about waste management and recycling [16] .Natural resources are derived from the environment. Some of them are essential for our survival while most are used for satisfying our wants [17]. Knowledge of students about natural resources conservation was very poor (27.15%) compared to Omani's knowledge about this issue which was in a rate of (62.5%) [18]. Results of the current study revealed a non-significant difference in gender distribution regarding level of knowledge although there was higher level of knowledge among females than males. In Iran there was higher knowledge of males over females [15]. Studies in China had demonstrated that women had greater participation in environmental behaviors inside of the home (e.g., recycling), while outside of the

home (e.g., environmental organization donations) no gendered patterns were exhibited [(11)]. Years of study had effect on the level of knowledge of students as 4th year students had higher rate but the difference is not great as one should expect from students in the health field and this is further emphasized by the higher results of the Technical pathological analysis department students over the technical community health students who should have the highest score according to the subjects in their curriculum, but the results were opposite to expectations indicating an error either in the topics of environmental health lessons or the perception of students to these topics.

Recommendation:

1. Development and implementation of environmental education programs as part of the regular school curriculum
2. Environmental education should be part of the curriculum of all departments of the college to ensure the consistency of environmental practices among students, and it should address both local environmental issues and global environmental problems.
3. Pamphlets and guides distributed to the students may help to remind them about the importance of healthy environment and how to achieve that.
4. Audits biannually can press students to improve performance. This action needs technical support provided by the college to launch a sustainability audit project involving training and a manual.

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