STUDYING THE LEVEL OF KNOWLEDGE AND PRACTICE OF THE STUDENTS IN KERMANSHAH FACULTY OF HEALTH ABOUT THE HYGIENIC AND ENVIRONMENTAL EFFECTS OF THE HAZE PHENOMENON

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Abstract

Introduction: The haze phenomenon is one of the atmospheric – continental disasters and has undesirable effects on the health and environment. This phenomenon is one of the greatest and the most important environmental problems and occurs in different parts of the world. Therefore, it is important to plan and increase the level of hygienic knowledge and performance in endangered population especially students. This study aimed to evaluate the knowledge and performance of students about the hygienic and environmental effects, which are caused by occurrence and diffusion of haze phenomenon.

Method: This descriptive – analytical study was done to evaluate the hygienic knowledge and performance of the students in confronting the haze phenomenon. In this regard, a questionnaire was used that includes 30 questions and also the SPSS was used for data analysis.

Results and Discussion: The results show that 40.6% of respondents have high knowledge, 57% have an intermediate level of knowledge and 2.4% of them have poor knowledge. But only 25.1% of the respondents have proper performance in confronting the haze phenomenon.

Conclusion: The results showed that among five main variables (age, gender, the major and level of study) there is a significant relation only between the major of study and the level of knowledge and performance. Therefore training programs in order to increase knowledge in all levels of education and fields are necessary.

Keywords: Air pollution, haze, knowledge, practice.
1. Introduction

The haze phenomenon is one of the most important and greatest environmental problems and occurs in different parts of the world and today it is considered as an atmospheric – continental disaster, which disfigures the environment and has undesirable effects on health. Iran is one of the countries and is affected by this phenomenon. According to the recent drought of in southern and western areas of Iran, our country is severely affected by this newfound phenomenon [1-2]. Haze storms occur different times during each year. So that the national statistics state that the average of days with haze in Khuzestan during hot periods of year especially in August are more than cold periods of year [3].

When the wind speed exceeds a certain level in wilderness areas, micro particulates enter the atmosphere and the haze is produced which depends on the surface roughness, soil moisture, density and the type of the vegetation, size of particulates and the topography [4-5]. Unstable weather and its proximity with humidity or in the lack of humidity is one of the most important conditions in creating haze, so that in the presence of humidity the unstable weather creates rainfall, storms and thunders but if there isn’t any humidity, the unstable weather creates haze storms [6]. On the other hand the lack of vegetation in susceptible areas for occurring haze causes warming the above air of these areas and also moving up the particulates, and when the high speed winds hit the troposphere, a rotating flow, which is downwards is created. The encounter of these winds with the surface of the land creates haze storms and this phenomenon is mainly reported more in the areas where the raining rate is less than 50 mm in a year [4]. This phenomenon also occurs because of natural and human factors, thus the human changes in the natural environment is one of the key factors in increasing haze sources, so that in this period it was claimed that human and its agricultural and industrial activities causes increasing the haze in the atmosphere [7]. Haze storms are due to strong winds and they can pollute the air and reduce the horizontal visibility to less than 1000 meters. The airflow haze is created by high winds and reduces the visibility to 1000-10000 meters. Also in the phenomenon of suspended haze, the tiny particulates are suspended in the lower part of the troposphere and the horizontal visibility is limited to less than 10000 meters [8]. The consequences of haze can be disorderliness in land and air navigation, destructive social and economic effects, the harmful effects in agriculture, pasturages and ranches, the interaction effect on the atmospheric phenomenon and parameters. The haze phenomenon can pollute drinking water and thus can cause epidemics diseases such as intestinal and digestive diseases [9]. The studies about physical and chemical combinations of haze which were done in the west of Iran show that these hazes have adverse effects on the respiratory
system, lungs and generally on the human’s health [10]. The scientific researchers show that in the last two decades, and in the viewpoint of the public health, the particulates are considered as one of the main pollutants. The world health organization estimates that annually 500000 persons pass away by premature death because of airborne aerosols in the atmosphere, so they increase the annual health and treatment costs, so that these costs have been about 30 billion pounds in Austria, France and Switzerland and this kind of deaths are about 6 percent of all deaths [11]. The aerosols which are 10 micros or smaller increase the risk of respiratory death in children and also they increase the asthma attacks and other respiratory symptoms such as cough and bronchitis. On the other hand it was proven that the aerosols which are 2.5 microns or smaller influence on human health and they increase the risk of death cause by heart diseases, respiratory diseases and cancer to 14 percent [12]. The American aerospace experts believe that 1 g of these hazes contains billions of bacterial cells which make serious problems for the respiratory system and subsequently they increase deathful epidemics around the world. Although these aerosols have African and Middle Eastern source but they can pass through the Middle East, including Iran and penetrate India and China and also pass through the Pacific Ocean and penetrate North America [13].

The results show that when the haze phenomenon occurs in Ahvaz, the visits of respiratory patients to health and treatment centers increase to 70 percent. In addition it has been predicted that the damages due to the haze on kitchen garden products, wheat and corn were 15 to 20 percent. Also it has been estimated that the costs of treatment, closure of schools, offices and airports were more than 4000 billion romans per year [14]. The main sources of the entered hazes to the west of Iran are desert areas which are close to Iran like the Syrian Desert, the desert of Iraq, the desert which is located in the north of the Arabian Peninsula, and in this regard the role of the Sahara is very negligible [15]. Increasing the people’s awareness by providing public education and training can be effective in reducing the health and environmental effects of this phenomenon.

In this regard the students are considered as the future custodians of the country’s health, so increasing their knowledge and applying hygienic behaviors to them will be some effective factors for preventing and controlling the harmful effects of this phenomenon. So it was necessary to carry out a study to evaluate the level of knowledge and performance in students of the Kermanshah hygiene school, because this phenomenon occurs a lot in this city and already no one focus on this phenomenon in any colleges or other educational institutions.
2. Method

This sectional-descriptive study was done using providing and completing a questionnaire among the statistical population “The students of hygiene school of Kermanshah”. The questionnaire which was used in this study consists of 3 parts, demographic questions (age, gender, the field of study and the level of education), questions which are for evaluating the level of knowledge (consist of 21 multiple-choice questions about the definition of air pollution, the daily use of food and air, source, the transferor factors and the diseases associated with the haze phenomenon, preventive ways) and questions which are used for studying the level of performance (including 6 questions about the necessary proceeding during occurring haze phenomenon, the ways for reducing haze entry into residential areas, kind of used mask and the effect of educational classes). In order to fill the questionnaire, at first the questioner completely explains the questions for respondents and clarifies how to complete the questionnaire and after 1 hour the completed questionnaire will be collected.

The studied population includes all of the students in hygiene school of Kermanshah. The students were divided into 5 majors including biostatistics, the food, the diseases, occupational safety and health and environmental health and also they were divided into 3 educational levels including associate degree, bachelor’s degree and master’s degree. The sample size was specified by appropriate stratified sampling in each category and 207 questionnaires were randomly distributed among the students with different majors and educational levels. This sample size was calculated using the method of specifying the sample size (Cochran formula) and also by considering all of the students of the hygiene school of Kermanshah. Each question has a score that depends on the question’s hardness, and finally we can grade the level of performance and knowledge by summing these scores. The grades between 0 to 7, 7 to 14 and 14 to 20 respectively show the poor knowledge, an intermediate level of knowledge and good knowledge.

The relevancy of independent variables and the level of knowledge are modeled by multiple linear regressions and the relevancy of independent variables and the performance of respondents is modeled by multiple logistic regression and also both models are modeled in a one-parameter form. In this study, the multi parameters technique was used to remove the effect of distortive factors and the results be estimated in a modified form. The used variables in the model include age, gender, the major of study (biostatistics, the food, the diseases, occupational safety and health and environmental health) and the level of education (associate degree, bachelor’s degree and master’s degree). The results were expressed
by linear mean (for linear regression) and odds ratio (for logistic regression) while the confidence interval was 95 percent. In this model, the variables of major and level of education were used factitive. Since the food among the variables of major and associate degree in the variables of level of education had the lowest level of knowledge, so they were put in the base group. And also the Spearman correlation coefficient was used to find the relation between the level of knowledge and the student’s performance. The SPSS version 21 was used for data analyzing.

3. Results and discussions

In this study there are 207 participants. 159 (76.8%) persons were female and 48 (23.2%) persons were male. 88 (42.5%) persons were the students of environmental health, 54 (26.1%) persons were the students of public health, 51 (24.6%) persons were the students of occupational health, 11 (5.3%) persons were the students of food health and 3 (1.4%) persons were the students of biostatistical. 33 (16%), 156 (75.7%) and 17 (8.3%) of participants were respectively the students of associate degree, bachelor’s degree and master’s degree in the faculty of health, Kermanshah. 25.7% of the respondents are younger than 20 years old, 45.7% are 21-23 years old, 24% are 24-30 years old and 4.6% are older than 30 years old.

3-1. The status of the level of knowledge

Figure 1 shows the level of knowledge in respondents. Among 207 participants, 41% were completely aware of this phenomenon while 57% of them have an intermediate level of knowledge and 2% have poor knowledge. The results of studying the relation between these four main variables are listed in Table 1, it shows that there is a significant relation between knowledge and the field of study (P<0.01). So that the results of the one way analysis ANOVA showed that the average of awareness in the majors including environmental health, public health, occupational health, food health and biostatistical are respectively 13.5%, 13%, 12.6%, 10.8% and 12.2% while the confidence interval is 95% and it indicates that the major of study influence on the level of knowledge. Due to the nature of the environmental health, the students of this major pass different courses about environment, so they have more knowledge about this phenomenon and the result of this study is logical. The T-test with two variables was used to study the relation between gender and the level of knowledge. In this study, we found that there is a significant correlation between the main variable and the dependent variable (P<0.05). The results showed that when the confidence interval is 95%, the average ratio of knowledge in male students is 13.8 while the average of knowledge in female students is 12.7. Studying the relation between the knowledge and the level of education by ANOVA test shows that there is a significant relation between knowledge and the level of
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education (P<0.00). So that when the confidence interval is 95%, the average awareness of the students of associate degree, bachelor’s degree and master’s degree are respectively 11.5%, 13.2% and 13.9%. Since most of the respondents of statistical population are the students of master’s degree in the major of environmental health, so the results, which are in accordance with the field of study and confirm that the environmental health students have more knowledge, are logical. Age is another main variable for studying in this survey and its relation with knowledge is significant too.

By using probable distortive variables in the model, the variables of gender and age are not significant in the level of knowledge in students of hygiene school of Kermanshah, especially when the haze phenomenon occurs (P>0.05). While we use probable distortive variables, the haze phenomenon occurs and the dust spreads into air, the average level of knowledge in students of hygiene school of Kermanshah for different majors like diseases (P<0.001, CI: 3.95 – 0.72), occupational safety and health (P<0.01, CI: 4.51 – 0.86) and environmental health (P<0.01, CI: 14.3 – 4.12) is respectively 2.33, 2.68 and 2.58 scores more than the level of knowledge in the students of food in this faculty.

![Figure 1: The status of knowledge in respondents.](image)

By considering the probable distortive variables while the haze phenomenon occurs, the difference between the level of knowledge in bio statistical students and the food students of Kermanshah hygiene school were not significant (P>0.05).

By using probable distortive variables when the haze phenomenon occurs, the average of knowledge in bachelor’s degree (P<0.01, CI: 0.7 – 3.47) students and master’s degree (P<0.049, CI: 0.01 – 4.44) students was respectively 2.08 and 2.23 scores more than the average knowledge in associate degree students of hygiene school of Kermanshah. When the variables of age and gender are used individually in the model, these two variables are significant in the level of knowledge in students, but in adjusted model and in the presence of the distortive factors, these two variables don’t influence on the student’s knowledge.
Table 1: The effect of demographic variables on knowledge of students in both crude and adjusted mode.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Coefficient</th>
<th>Confidence interval</th>
<th>Coefficient</th>
<th>Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (Female)</td>
<td>1.011</td>
<td>0.2·1.82</td>
<td>0.191</td>
<td>-0.73·1.11</td>
</tr>
<tr>
<td>Age</td>
<td>0.154</td>
<td>0.06·0.25</td>
<td>0.074</td>
<td>-0.04·0.19</td>
</tr>
<tr>
<td>Field of Study (Food Health)</td>
<td>2.26</td>
<td>0.65·3.87</td>
<td>2.334</td>
<td>0.7·3.47</td>
</tr>
<tr>
<td>Disease</td>
<td>1.82</td>
<td>0.2·3.44</td>
<td>2.685</td>
<td>0.86·4.51</td>
</tr>
<tr>
<td>Occupational Health</td>
<td>2.68</td>
<td>1.12·4.23</td>
<td>2.576</td>
<td>1.03·4.13</td>
</tr>
<tr>
<td>Environmental Health</td>
<td>1.43</td>
<td>-1.74·4.61</td>
<td>1.49</td>
<td>-2.36·5.35</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>1.69</td>
<td>0.77·2.62</td>
<td>2.085</td>
<td>0.7·3.47</td>
</tr>
<tr>
<td>Field of Study (Associate degree)</td>
<td>2.44</td>
<td>0.1·3.88</td>
<td>2.228</td>
<td>0.01·4.44</td>
</tr>
</tbody>
</table>

- Reference group inside bracket

3-2. The status of level of performance

Figure 2 shows the study of the level of performance in respondents. The population includes 207 participants and 25 percent have high performance about this phenomenon while 55 percent of these students have an intermediate level of performance and 20 percent have weak performance. Table 2 shows the relation between four main variables. There isn’t any significant relation between the performance and the field of study (P>0.1). This result which is draw out using one-way analysis ANOVA between these two parameters shows that although the students of environmental health have higher level of knowledge, but it isn’t appeared in their performance. Studying the relation between the performance and the gender using T-test with two independent samples shows that there isn’t any relation between these two parameters, and the gender of the respondents has no effect on their performance, and also the results of this study show that the knowledge in men is more than women. Studying the relation between the score of performance and the level of education shows that there isn’t any significant relation between these two factors (P>0.6). But studying the relation between the score of performance and the age while the confident interval is 95% shows a significant statistical relation (P<0.01).
By using the probable distortive variables in the model while the haze phenomenon occurs, the variables of gender and age are not significant in the performance of students in Kermanshah hygiene school (P>0.05). By using the probable distortive variables in the model while the haze phenomenon occurs, the average performance of occupational safety and health students (P<0.05, CI: 0.42 – 6.71) were 3.56 scores more than the average performance of the food students in Kermanshah hygiene school. By using the probable distortive variables in the model while the haze phenomenon occurs, the differences between the average performance of students of bio statistical, the diseases and the environmental health with the food students were not significant (P>0.05). Also by using the probable distortive variables in the model while the haze phenomenon occurs, the differences in performance of bachelor’s degree and master’s degree students of Kermanshah hygiene school were not significant in comparison with the associate degree students (P>0.05). Using the probable distortive variables such as age, gender and the level of education in the model while the haze phenomenon occurs was not significant in the performance of students in Kermanshah hygiene school (P>0.05). By using the probable distortive variables in the model, the chance of having good performance in Kermanshah citizens for providing strategies to control air pollution in occupational safety and health (P<0.05) students and environmental (P<0.05) students were respectively 19.63 and 5.98 times more than the food students. More details are shown in table 2.

Table 2: The effect of demographic variables on performance of students in both crude and adjusted models.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Modified models</th>
<th>Confidence interval</th>
<th>Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex(Female)</td>
<td>1.14</td>
<td>0.44-2.91</td>
<td>0.93</td>
</tr>
</tbody>
</table>
The mean and the standard deviation of student’s knowledge and performance according to the field of study and the level of education are shown in table 3. The results show that the correlation between the knowledge and performance is 0.291 and it is significant when P>0.01.

Table-3: The mean (SD) knowledge and practice in terms of demographic variables.

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Knowledge</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Health</td>
<td>10.85(2.08)</td>
<td>8.27(4.61)</td>
</tr>
<tr>
<td>Disease</td>
<td>13.11(2.67)</td>
<td>10.24(2.77)</td>
</tr>
<tr>
<td>Occupational Health</td>
<td>12.66(73.2)</td>
<td>11.2(3.83)</td>
</tr>
<tr>
<td>Environmental Health</td>
<td>13.52(2.22)</td>
<td>10/65(4.18)</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>12.28(1.52)</td>
<td>11.75(3.44)</td>
</tr>
</tbody>
</table>

4. Conclusion

Studying the level of hygiene knowledge and performance of hygiene students in facing the haze phenomenon shows that it is necessary to use continuing education programs to have an on time and appropriate performance. On the other hand
the results show that the environmental health students have better level of knowledge. According to the nature of the hygiene majors that insist on knowing the hygienic effects and also the ways of controlling this phenomenon, it is necessary to provide some training books that cover all fields, and subsequently promote and improve the knowledge of the target population.

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References

1. Mofidi A. Jafari S. The role of regional atmospheric circulation over the Middle East in summer dust storms in the South West of Iran. Arid Geographical Studies Year 2011; (2):17-45.


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