A Comparison between Knowledge of Medical Students and Graduates at Birjand University of Medical Sciences concerning Zoonoses (Crimean-Congo fever, brucellosis, and rabies)

Background and Aim: Although it is twenty-first century, the leading cause of mortality in several countries still resides with infectious diseases. From among the infectious diseases, zoonoses, gain double importance because of their epidemiologic control nature. This study aimed to compare knowledge of medical students and graduates concerning zoonoses diseases.

Methodology: In this descriptive-analytic study, 75 medical students and 58 participants who were selected by the census. To assess the participants' knowledge of zoonoses at the four levels of clinical symptoms, transmission, diagnosis and prevention methods, a researcher-made questionnaire was devised according to Diseases' Management and Prevention Booklet of the Ministry of Healthcare and Medical Education upon supervision by infectious disease specialists. It had two sections: demographic characteristic and knowledge about the three diseases. The questionnaire was completed with SPSS using t-test.

Findings: Students' mean scores about brucellosis, Crimean Congo, and rabies were 13.88 ± 2.47, 13.2 ± 2.16, and 11.11 ± 2.42 respectively, while those of the graduates were 14.29 ± 2.33, 13.91 ± 2.11, and 11.11 ± 2.33 respectively. The difference between awareness scores of students and graduates was not significant (p > 0.05). However, there was a significant difference in their awareness scores of the diseases' management and prevention, with a p-value of 0.005. The awareness of students and graduates in brucellosis was significantly higher than in Crimean Congo and rabies (p < 0.05). The awareness of students and graduates in Crimean Congo was significantly higher than in rabies (p < 0.05).

Conclusion: The findings indicate that there is no difference in the awareness of students and graduates. However, there is a significant difference in their awareness scores of the diseases' management and prevention.

Keywords: brucellosis, Crimean Congo fever, rabies, students' awareness, medical graduates' awareness.

ORIGINAL ARTICLE

Sample size and sampling:

Medical students and graduates of the Faculty of Medicine at Birjand University of Medical Sciences, Birjand, Iran were involved in the study. The study was a cross-sectional descriptive study. The sample size was determined as 75 medical students and 58 graduates using the following formula:

\[ n = \frac{Z_{\alpha/2}^2 \times P \times (1-P)}{d^2} \]

where: \( n \) is the sample size, \( Z_{\alpha/2} \) is the Z-score for the desired confidence level, \( P \) is the estimated prevalence, and \( d \) is the desired precision. The sample size was calculated as 75 students and 58 graduates.

Instruments:
The participants were administered a questionnaire with 18 questions related to brucellosis, Crimean Congo fever, and rabies. The questionnaire was divided into two sections: demographic characteristics and knowledge about the diseases. The questionnaire was completed using SPSS software.

Data analysis:
The data were analyzed using SPSS software. The data were presented using descriptive statistics such as mean, standard deviation, and frequency. The Student's t-test was used to compare the mean scores of medical students and graduates.

Results:
The mean scores of medical students and graduates were compared in Table 1. The results showed that there was no significant difference in the awareness scores of students and graduates in brucellosis, Crimean Congo, and rabies. However, there was a significant difference in their awareness scores of the diseases' management and prevention, with a p-value of 0.005. The awareness of students and graduates in brucellosis was significantly higher than in Crimean Congo and rabies (p < 0.05). The awareness of students and graduates in Crimean Congo was significantly higher than in rabies (p < 0.05).

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INTRODUCTION

Today, infectious diseases are the first cause of morbidity and mortality in many countries (1). Among infectious diseases, zoonotic diseases which are common between humans and animals are more important due to the epidemiologic control issues. More than 100 Million dollars are spent annually by the Ministry of Health for common diseases between humans and animals and they are still considered as one of the Health problems in the country. Some of them are brucellosis, rabies and is CCHF (2). Crimean-Congo fever is a potentially serious illness in humans caused by the virus From Bunyavirideh family, and is seen in parts of Asia, Eastern Europe and the Middle East. Transmission to humans happens through tick bites, contact with Crimean-Congo fever patients when they are in acute phase, and through contact with blood, secrations or tissues of infected animals. Due to high mortality and epidemiologic issues of the disease, it has a particular importance and And because of the transmission of the disease through contact with contaminated secretions is one of the most important nosocomial infections. The case fatality rate of the disease varies from 3 to 30%. The occurrence of the disease in more cities of Iran is rising (3). General practitioners as the first level of dealing with Crimean-Congo fever patients have a fundamental role in the proper implementation of the health care system and their awareness about the necessity of reporting of disease as well as implementing the next stages of the disease surveillance system will be an important part of the success of control programs. (4) Unfortunately, the Researches which are done in recent years on the Knowledge of physicians from Infectious Diseases show that their information is not at the desirable levels. In a cross-sectional study done in Zahedan which evaluated practitioners’ awareness of the disease showed that 42% of them had low information level about the disease (1). In a study which is done in Zahedan to evaluate the general practitioners knowledge from Congo fever, none of them had sufficient information and 50% had moderate information. There were no significant differences between the Doctors Information about the disease and the university he graduated from or with his work experiences. Also the average knowledge about the disease among the doctors who participated in the program of re-education about Congo fever was significantly higher than the rest of them. In a study conducted in 2008 in Sistan and Baluchistan and Isfahan to evaluate the Knowledge and Attitude of Health care workers about Congo fever showed that being physician, working in Isfahan and working in a academy than in the private sector was related to a greater degree of knowledge, and higher levels of education and working in the lab was associated with higher levels of attitude (5). In a study in the area of Balochistan 235 laboratory technicians were assessed which 66% of them knew the disease. 80% of doctors, 60% of nurses and 14% of laboratory technicians had prior knowledge about Crimean-Congo fever. 80% of doctors expressed the fever as the most common symptom of the disease. All of the participants had low information about the disease (6). Another study which is done in Beheshti University of Medical Sciences in Tehran showed that the higher levels of doctors Information about the disease whom works in metropolitan area is related to more Reference of the patients to this hospitals (7). Another disease which is examined in this study is brucellosis that occurs as acute, subacute, or chronic. The disease usually cause GU infection in the animals and causes fever, sweating, weakness, lethargy, weight loss in humans (8). Also can cause focal purulent infection in the liver, spleen, bones and other organs. This disease is called as the thousand faces disease due to its long lasting effects. Brucellosis agent is a small cocobacil that involves the wide range of mammals, including humans, cattle, sheep, goats, pigs, rodents and marine mammals. The disease is transmitted through oral-fecal rout, respiratory tract, skin, and eye and even is transmitted to humans through the placenta. According to the World Health Organization, approximately 500,000 new cases are reported annually and the most common species are Brucella melitensis. Malta fever is endemic in Iran particularly in rural areas (8) and Despite the decline in recent years is still regarded as one of the health and economic problems, because livestock and animal husbandry is an integral part of the lives of villagers and farmers. (5) During a study, 57% of physicians had perfect information about brucellosis, but 18% of them had no idea of transmission ways other than the consumption of unpasteurized milk. (9) In another study that was carried out in the Kashan city to evaluate students awareness about brucellosis, results showed that their information about the disease is not satisfactory. (8) In a study in 2015 on medical personnel to evaluate their information about brucellosis also showed their awareness was very low and the need for training in this regard was so necessary. (10) Rabies, the third one that we studied is one of the most important and dangerous zoonotic disease. In the case of rabies, 55,000 deaths and 17.4 million bite occurs annually. Because rabies is a zoonotic disease in humans and wild animals, in terms of disease control and epidemiology of that is more important and more difficult than the other zoonotic ones. (10) In a study which was performed on 110 medical doctors their information about rabies 53.9%, had average information and 15.4% had well informed about the disease. All of them knew that dog as reservoirs of disease, and 14% knew that the disease would develop by biting other animals other than dogs. (11) In another study which was performed on 50 interns and 50 doctors in Shiraz, the results showed that 95% were aware of the viral cause of the disease and 83% of them knew about the signs and symptoms perfectly and 46% thought that the disease is treatable. 98% express that the dog is the cause and reservoir of the disease, 92% knew the incubation period and 8% knew that Inhalation is a way of transmission. 80% were aware of the effectiveness of vaccination in certain groups. (4) According to a survey conducted these studies, in the case of each disease alone, results show that physicians and medical staff information are so imperfect and none of the studies investigated the knowledge level of graduates and students at the same time. Since the implementation and planning of any educational program need to review the current situation, Information gaps need to be assessed. Therefore,
this study was carried out with the aim of comparison of the knowledge of the Medical students and graduates about the brucellosis and according to the results appropriate action be taken in this regard.

**METHODS**

This cross-sectional descriptive-analytic study carried out as sectional. The studied population was all the general practitioners working in clinics and hospitals in the city of Birjand. The inclusion criteria were graduating from the Birjand University of Medical Sciences Included 58 Doctors and 73 medical students entering clinical departments which were selected through censuses. To assess their level of awareness through Zoonotic diseases (Brucellosis, Congo, rabies) in four levels of clinical symptoms, transmission and detection and prevention, a survey was made by researcher based on manual management and Prevention principles from Iran Ministry of Health with the help of experts in infectious diseases that the validity was confirmed by 5 experts in infectious diseases and its reliability was Calculated with pilot study and Cronbach’s alpha was 0.82. The questionnaire consisted of two parts: part one; demographic information, Part II; the awareness about the three diseases: brucellosis, rabies and Congo fever. In the knowledge section There were 20 questions to assess knowledge in relation to brucellosis, 19 questions about rabies and 19 questions about the Congo's disease, they had to answer the questions with a yes (true) and no (false) about what was said about the disease, another option is also set for the persons who had no idea about the answer that made the answers partly not marked by chance and the participants were not forced to choose either yes or no. A score was given to each question and no questions had a negative score. The data collection then entered the software of SPSS and were analyzed by t-test statistical test.

**RESULTS**

44.3% of participants in the study were graduates (58) and 55.7% were students (73). 57.7% of the participants were women. 78 participants had the mean age under 30 years, 29 participants aged between 31 and 41 years. 18 participants had over 40 years old and 6 participants did not respond to this question. Overall knowledge about the brucellosis was 2.47 ± 13.8841 in the students group and 14.29 ± 2.93358 in the graduates. Signs of brucellosis: 4.3429 ± 1.16576 in the students’ group and 1.04944 ± 4.32. About the transmission of brucellosis: 3.0548 ± 7.6177 in the students’ group and 85840 ± 3 in the graduates’ group. About the prevention of brucellosis 1.3 ± 4.16 of the participants answer right. Treatment of brucellosis: 85 ± 2.31 in the students’ group and 1.12 ± 2.72 in the graduates’ group. Average overall students and graduates knowledges about rabies was 2.42 ± 11.11 and 11.37 ± 2.33 respectively, about symptoms of rabies 2.97 ± 1.1 in the students and .83 ± 2.75 in the graduates’ group. About the transmission ways of rabies: 2.52 ± .8 in the students’ group and.85 ± 2.63 in the graduates’ group. About the ways to prevent rabies 1.04 ± 2.52 and rabies treatment: students and graduates were 1 ± 2.83. VS 2.79 ± 1.1. Average overall knowledge about, Congo fever 2.16 ± 13.23 among the students’ group vs 13.91 ± 2.32 graduates’ group, Congo symptoms: 5.28 ± 1.11 students and 1.17 ± 5.44 graduates. About the ways of transmission of the Congo fever: 3.28 ± .63 students and graduates' groups. 71 ± 3.49 on the prevention of Congo fever. 83 ± 1.84, the treatment of the Congo fever: Students and Graduates .69 ± 2.62 and .76 ± 2.51, respectively.

There were no significant differences between the knowledge level of brucellosis among the graduates and the students (p>0.05). The results also showed a significant difference between the knowledge of physicians and students about the prevention of human rabies (P<0.05) but in other issues, such as recognizing symptoms of rabies and rabies transmission ways and treatment of the disease the differences was not significant (P> 0.05). The results also showed significant differences between physicians and students information about the prevention of Congo fever disease (P<0.05). But in other issues, such as recognizing symptoms of Congo fever and transmission ways and treatment of the disease differences was not significant. (P>0.05)

**Chart 1. Comparison of students and graduates Information about brucellosis**

<table>
<thead>
<tr>
<th>Group</th>
<th>Average</th>
<th>The standard deviation</th>
<th>Significance</th>
<th>difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>11.1127</td>
<td>2.42339</td>
<td>.539</td>
<td>Does not exist (p&gt;0.05)</td>
</tr>
<tr>
<td>Graduates</td>
<td>11.3750</td>
<td>2.33209</td>
<td>.216</td>
<td>Does not exist (p&gt;0.05)</td>
</tr>
<tr>
<td>Signs and symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>2.9718</td>
<td>1.10805</td>
<td>.427</td>
<td>Does not exist (p&gt;0.05)</td>
</tr>
<tr>
<td>Graduates</td>
<td>2.7500</td>
<td>.83666</td>
<td>.012</td>
<td>Exist (P&lt;0.05)</td>
</tr>
<tr>
<td>Transmission Routs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>2.5211</td>
<td>.80816</td>
<td>.829</td>
<td>Does not exist (p&gt;0.05)</td>
</tr>
<tr>
<td>Graduates</td>
<td>2.6379</td>
<td>.85221</td>
<td>.012</td>
<td>Exist (P&lt;0.05)</td>
</tr>
<tr>
<td>Prevention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>2.5278</td>
<td>1.04776</td>
<td>.012</td>
<td>Exist (P&lt;0.05)</td>
</tr>
<tr>
<td>Graduates</td>
<td>2.9828</td>
<td>.96412</td>
<td>.829</td>
<td>Does not exist (p&gt;0.05)</td>
</tr>
<tr>
<td>Treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>2.8333</td>
<td>1.00702</td>
<td>.012</td>
<td>Exist (P&lt;0.05)</td>
</tr>
<tr>
<td>Graduates</td>
<td>2.7931</td>
<td>1.10436</td>
<td>.829</td>
<td>Does not exist (p&gt;0.05)</td>
</tr>
</tbody>
</table>
In this study, the knowledge level of the students and the graduates of Birjand University of Medical Sciences was assessed about three diseases, brucellosis, and rabies and Congo fever. The average score of students awareness about brucellosis was 47.2 ± 13.88, 16.2 ± 2.13 for Congo fever and 42.2 ± 11.11 for the rabies. The Average score for graduates awareness about brucellosis was 33.2 ± 14.29, 32.2 ± 9.13 for Congo fever and 33.2 ± 3.71 for rabies.

In a study which was carried out at the University of Kashan about Students awareness and knowledge about brucellosis the average score was 5.07 and female students’ knowledge was better than male students, further their knowledge was also not satisfactory.

In a study which was done in Zahedan about Crimean-Congo fever, the overall knowledge Score of general practitioners about the care system of Crimean-Congo haemorrhagic fever was minimum 3, maximum 27, with an average of 68/14 with a standard deviation of 75/4 and stated that none of the doctors were well informed about Crimean-Congo haemorrhagic fever surveillance system. Only 11% of physicians knew about the immediate reporting of suspected and probable cases of the disease (1). This study is made on 540 medical students and interns which 77% of them were male were no significant relationship between sex and knowledge-age and knowledge. A cross sectional study was conducted between June-September 2009 in 55 hospitals in Istanbul, the results showed that 66.9% did not know how to prevent the transmission of rabies (12). A study conducted in 2014 showed that 92.2% of participants didn’t know about the necessary and initial actions when exposuring a bite and 77.5 didn’t know about the disinfection the site of the bite and 75% didn’t know about the prophylactic vaccination and Ig. Studies show higher knowledge in Medical interns (13).

### DISCUSSION

In this study, the knowledge level of the students and the graduates of Birjand University of Medical Sciences was assessed about three diseases, brucellosis, and rabies and Congo fever. The average score of students awareness about brucellosis was 47.2 ± 13.88, 16.2 ± 2.13 for Congo fever and 42.2 ± 11.11 for the rabies. The Average score for graduates awareness about brucellosis was 33.2 ± 14.29, 32.2 ± 9.13 for Congo fever and 33.2 ± 3.71 for rabies. In a study which was carried out at the University of Kashan about Students awareness and knowledge about brucellosis the average score was 5.07 and female students’ knowledge was better than male students, further their knowledge was also not satisfactory.

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In another study that was done in 2002 on 622 medical students in Shiraz the results showed that 7.68% and 4.74% and 1.81% students in years of 5 and 6 and 7 respectively, that learning more about the isolation of the infectious disease had better performance than the others in case of exposuring the cases. The study also showed that inadequate knowledge may lead to lower performance, however, in some cases, students who had been trained were not well represented in the study (9). Thus, it shows that any types of
training can’t be effective in diagnosing, treating and preventing of the disease and trainings should be such way that lead to performance. ADESM and colleagues study in 2005 on 540 medical students and interns was also consistent with this study (14).

The results of studies from Çilingiroğlu et al. 2010 (15) and Tabatabaei et al 2014 (16) and Yilmaz et al. 2009 (12), Mostafaei 2013 (2) indicate the poor knowledge of doctors or medical students in the field of Brucellosis, Congo and Rabies so It is necessary to review the training of the diseases conducted in medical education.

The results also showed that there was no significant difference between the knowledge between the Students, Therefore, this can be indicative of the importance of the university education and Continuous training will be effective to repeat the topics to avoid forgetting science or learning new topics.

**CONCLUSION**

General practitioners play a major role in facing of outpatient as one of the most active groups of the health team, so according to this study the training programs based on assessments of graduates needs must take place after graduating. Considering that the results of our study showed that there were no significant differences in the knowledge of students and graduates and this shows the importance of studying and learning in the university period, therefore, it is necessary that all disease topics and information transferred to students based on community needs. More importantly, the ways of acquiring knowledge and new information should be taught to the students. It is also suggested that continuing education workshops to be held based on community need and not according to the tastes of educational groups. A continuing education program will be subject to the results of the needs assessment. Our country, along with all the improvements and valuable services in the health sector during these years, Faces enormous challenges that can be somewhat obviated with a health development plan, but there is still a huge gap between medical education and medical practice which is because of inconsistencies in medical education with the needs of society. Therefore, the focus of the medical education must be community-based instead of being patient-based medical education. Therefore, it is necessary to carry out an assessment in any educational topics according to the common diseases in the community and training will be conducted on the basis of the conditions that will lead to better performance training.

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