

## Study and Comparison the Knowledge of Medical and Public Health Students about Control and Treatment of TB with (DOTS) Strategy

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### Abstract

#### Introduction:

Training medical students and prepare them for diagnosis, treatment and care of diseases, is the main goal of medical education. According to importance of adapting educational content to the needs of society and the high incidence of infectious diseases in the country, decided to study the knowledge of medical students and public health students about Tuberculosis (TB) and Directly Observed Treatment, Short-course (DOTS), because they are the main stakeholders in the field at future.

#### Materials and Methods:

In a cross-sectional study using a questionnaire consisting of 40 questions related to the knowledge necessary measures in prevention, diagnosis and treatment of tuberculosis (DOTS), 90 students of public health and medical students who were taken by the stratified random sampling with Using a reliable and valid questionnaire. The results of the tests were analyzed by descriptive and analytical tests in SPSS11.5 software.

#### Results:

Average knowledge of public health students about TB was  $(9.24 \pm 9.091)$  of total 20 and knowledge of medical students was  $(8.67 \pm 1.954)$ . The mean of knowledge, diagnosis and treatment of Public health students was  $(16.91 \pm 3.168)$  of total 40 and of medical students was  $(16.42 \pm 3.720)$ . There was a significant linear correlation between general and technical students information about TB ( $r=0.681$ ,  $p=0.000$ ). T test showed there is not significant relationship between gender and field of study and students knowledge about TB; however, the infromation level in women was higher than in men.

#### Conclusion:

Knowledge of medical and health students about TB and DOTS is not in acceptable level and it is necessary to revise the education of tuberculosis in medical and health school.

**Keywords:**DOTS, Knowledge, Medical Students, Public Health Students, Tuberculosis.

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## Introduction

Tuberculosis (TB) is one of the most common communicable diseases world and continues to be a major global health problem. It causes disease among millions of people each year, and, after HIV, it ranks as the second leading cause of death from an infectious disease worldwide (1).

Also tuberculosis is one of the oldest diseases known to humanity, which despite the great achievements of human society, still remains a major health problem. Due to the socioeconomic problems and negligence in the treatment of tuberculosis, as well as HIV epidemy, in many countries there are a large number of smear positive patients often remain undiagnosed. On the other hand, patients' failure to visit a physician after initiation of complaints, Lack of timely diagnosis and treatment by a physician, inadequate treatment, improper administration of anti-TB drugs, patients' financial problems in preparing medications, and patients' inadequate information about their disease status and discontinuation the medication can lead to the creation of drug-resistant cases of TB. Since 1993, World Health Organization has accepted the Directly Observed Treatment, Short course (DOTS) as a global strategy for TB control. It is estimated that each year about 8-10 million people become infected with TB and 2-3 million people die annually due to this disease. The World Health Organization has declared tuberculosis a global emergency and has recommended efforts to control the disease. Tuberculosis is considered as an endemic and common disease in eastern mediterranean countries. Because of Iran's proximity to Pakistan and Afghanistan (which are among most contaminated regions in the world), our country is at serious risk of this disease. TB epidemiological indicators are annual infection rate, the incidence of disease, rate of complete cure, rate of relapse or

treatment failure and drug resistance rate. These rates vary in different regions and cities. Several factors are involved in this issue. One of them can be the knowledge and attitude of health care professionals (physician - health expert) about this disease. Experts believe that one of the most important and useful measures in the fight against diseases at different levels is health education and promotion of public medical and health science. Any plans for educational content in health depends on understanding and knowing educational needs of the audience. Considering the difficulties in treating resistant TB, identification of the medical students' knowledge as future doctors and public health students' knowledge as tuberculosis experts who will deal with the public directly, seems important (2-10).

In the statute of of medical colleges, matching the content of the educational programs with the health care needs of the country, is announced as one of the goals of establishment of those universities (11). In a study conducted by Fadaii Zadeh about tuberculosis, 73.5% of the 808 questionnaires completed by the public learned about TB, and 81% were aware of its symptoms correctly. 61% of 15 prevention and care technicians had correct information, 68% had correct attitude and 100% had correct operation. In the physicians group, only 26% of studied individuals had correct information about national guidelines for TB, 20% had correct attitude, and 52% had correct operation(2).

In a study by Talaei et al designed to assess the knowledge of general practitioners about control and treatment of TB with DOTS strategy and the necessity of its inclusion in the Educational Planning of medical schools, results showed that in 486 investigated samples, 69% and 14% of trained and untrained practitioners had answered the

questions correctly. 21.2% of doctors were involved in DOTS implementation. 82% of general practitioners who participated in the DOTS implementation and 33% of physicians, who did not participate, answered the questions correctly. 58% of physicians who were employed in health centers had provided correct answers to the questions. Therefore, researchers concluded that General Practitioner Students (GPs) have little knowledge about DOTS strategy, and thus entering DOTS strategy in the medical school curriculum planning seems necessary(3).

In a study by Ayatollahi, which was conducted to assess the knowledge and performance of Yazd medical students (students who are in their final two years of study) about chemoprophylaxis after exposure to infectious diseases, following results were obtained. In general, the interns' knowledge and performance were moderate and the mean knowledge and performance score were 16.05 (out of 20) and 17.58 (out of 20). 18.5% of interns had poor knowledge, 60.5% had moderate, and 21% had good knowledge. The researcher concluded that the interns' knowledge and performance about infectious diseases is poor and more education about transmission and prevention, especially after exposure is needed(4).

In a study by Majidpour, which was performed to investigate the knowledge, attitudes and performance about the prevention and control of TB in people of the Ardebil city in comparison with patients with smear positive pulmonary tuberculosis, Statistical analysis showed significant differences in the healthy individuals' and patients' performance about the nature, prevention and control of disease. This study showed a significant correlation between age, gender and job and the knowledge and performance in the prevention and control of tuberculosis in patients and healthy individuals. X<sup>2</sup> test

was conducted between education level and the knowledge, attitude and performance of patients and it showed no significant correlation. Regardless of education levels, patients had good knowledge about the disease, but in healthy individuals by increasing education level, knowledge and performance went up. This study revealed weak performance of healthy individuals in the control of TB. The researchers concluded that in addition to focusing on improving the people's performance with the necessary trainings, other factors such as poverty, malnutrition, population density, etc. should be considered as causes of TB's high prevalence(5).

In a study by Jamshidi et al, which was conducted in Bandar Abbas to evaluate physicians' knowledge about TB and DOTS method, following results were obtained. Physicians mean score was 16.25 of 29 (GPs score was 15.75 and specialists score was 15.93), which was not statistically significant. The highest percentage of Physicians' correct answers belonged to questions about DOTS (70.5%) and after that, questions about treatment (59.4%), clinical signs (56.5%), and diagnosis (49%). 40.7% of physicians had knowledge about case finding of TB, which is the basis of tuberculosis control in the community. Therefore, according to this study, physicians' knowledge about TB in general or specialist levels was moderate to weak. Thus, more appropriate educational programming about TB is required in both undergraduate and postgraduate levels (6).

In a study by Alavi et al, which was performed in Khuzestan province to evaluate the knowledge about tuberculosis in two cities with different tuberculosis epidemiological indicators, following results were obtained. The mean knowledge about TB transmission in Omidiyeh was 6 and it was 10 in

Behbahan. The mean knowledge about ways to Deal with tuberculosis was 9 and 13 in Omidiyeh and Behbahan (7).

In a study by Jamaati et al, which was conducted to investigate the factors affecting the failure of tuberculosis treatment, following results were obtained. Precise control and supervision of TB with DOTS, reducing delay in definitive treatment of tuberculosis, giving patients more information about their disease, prescription proper treatment and medication by physicians, starting quadruple therapeutic regimen, and full duration of TB treatment can be effective in the prevention of failure in TB treatment and Avoidance of drug resistance (12).

In a study by nasehi et al, which was conducted to investigate the factors influencing health care system delays in the diagnosis and treatment of contagious TB in Iran, following results were obtained. For reducing the duration of health care system delay, which is a major part of overall delay in the diagnosis and treatment of patients, it is necessary for health care providers, especially private practitioners, to retrain diagnosis and treatment of this disease in regular intervals and it is required to integrate the topic of TB in medical and paramedical students' curriculum. It is needed to emphasize on the necessity of repeating smear tests and using chest radiographs in suspected patients if the disease symptoms are persistent. In addition, it is required to suspect TB in patients with a history of chronic respiratory diseases if their symptoms become exacerbated(13).

In a study by Tavanaei Sani et al, which was performed to investigate the success of DOTS strategy and to estimate the rate of drug-resistant TB in Mashhad, using descriptive cross-sectional on all registered TB patients in Mashhad health centers during 2000-2002, following results were obtained. In this study, variables like age,

sex, drugs, occupation, marital status, nationality, prison records, type of TB (pulmonary - extrapulmonary) and finally the treatment results were evaluated. Results showed that of 2840 patients, 75% were Iranian and 24% were Afghan, 39.9% were male and 60.1% were female. Highest rate was in people over 65 years old. 1518 persons (53.5%) of these patients had smear positive pulmonary tuberculosis, 437 persons (15.4%) had smear-negative pulmonary TB, 885 patients (31.1%) had Extra pulmonary TB, 2610 patients (91.9%) were new cases and 1383 persons (48%) had smear positive pulmonary tuberculosis and were new cases. Following the treatment with DOTS, cure rate was 66.2%, 11.9% of patients completed the treatment period, death rate due to TB was 0.7%, death rate due to other causes was 1.3%, death rate due to unknown causes was 4.6%, treatment failure rate was 2.5%, 6.7% of patients refused to participate in treatment and 6.3% of patients were transferred to other locations. The researchers concluded that the success rate in that study was 78.1% (compared with 85% for WHO), which part of that was due to transfer to other locations. The treatment failure rate was 2.5% (compared with less than 4% of the WHO) and the rate of patients who refuse to participate in treatment was 6.7% (compared with less than 10% of the WHO) (14).

The studies conducted in other countries confirm the weakness of physicians' knowledge about common infectious diseases. For example, in a study, which was conducted to investigate medical students' knowledge about TB, results have shown that only 30% of medical students were able to diagnose and treat TB patients. This issue led to a revision of TB education, so that after revision 90% of physicians had enough knowledge in the field of tuberculosis(15). Another study

was conducted by Ollé-Goig indicated that there are problems in education of tuberculosis (16). Another study, which was conducted in Norway and England, in 1997, showed that the Physicians' knowledge about tuberculosis has been very low (17). In another study conducted by Kasraeian et al, results showed that the average doctors' score about TB was 4.53 (of the total 11 score). Overall, the Physicians' knowledge about cure was better than diagnosis and prevention (18).

Although the principles of TB management are well defined, this infectious disease is often not properly diagnosed and treated. Insufficient knowledge among doctors about TB is one of the reasons for this failure. Despite the abundance of information on all content areas of TB, clinicians still make frequent errors in TB treatment (19).

### Materials and Methods

This research is a descriptive analytic study. The sample size consisted of senior undergraduate public health students (n=45) and senior medical students (n=45). In this study, after the approval of the university research Council, necessary coordination with officials of the faculty of Health (Head of school, Assistant training schools) was done. After presence in public health senior students' classes and getting permission from their teachers, questionnaires were distributed among students. Then, after researchers' introduction, expression of research objectives was done. It was noted that participating in this study is not mandatory and it is not necessary for students to write their names. In addition, it was expressed that in order to know their score, they can write their emails on the questionnaire form, so their score about TB would be emailed to them. It was expressed that the general results will be published in paper format. Finally, by eliminating incomplete

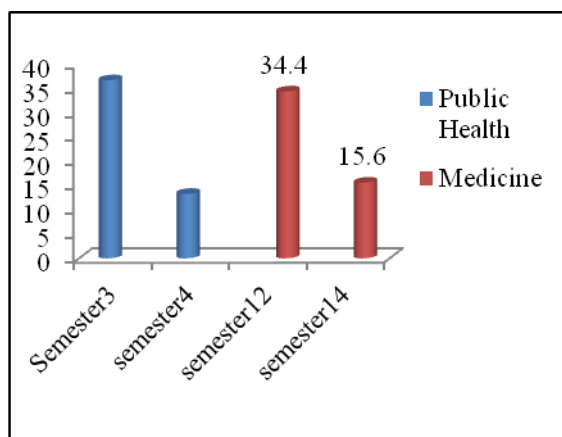
questionnaires, 45 students entered the study and completed the questionnaires. The minimum number of samples for medical students, with an error of 05%, reliability of 95% and accuracy of 03%, were determined 45 students. Sampling method was stratified in the first stage and simple random in the next stage. In this case, after coordination with officials of medical faculty (Head of school, Assistant training schools), and presence in Ghaem and Imam Reza hospitals, the pediatrics, gynecology, urology, neurology and ENT departments were chosen randomly. In those departments, In addition to introducing to the authorities of the department and coordinating with the secretary of the department, introduction to medical students and expression of research objectives was done and their partnership were attracted to participate voluntarily in the study. Finally, 53 questionnaires were collected and because all questionnaires were not completed carefully, 8 questionnaires excluded and ultimately 45 medical students entered the study. The questionnaire included two parts of demographic questions as well as questions about the tuberculosis. 40 questions were about TB, 20 of them were general and other 20 questions were specialized. The questionnaire was made by the researcher, and its validity and reliability was confirmed by connoisseurs and experts. Questionnaire validity was set by using books, articles, scientific guidelines and Benefiting teachers, professors and health center experts' views in the department of infectious diseases of Mashhad University of Medical Sciences. To determine its reliability, internal consistency method (Cronbach's alpha coefficient), was used. The coefficient was calculated 0.89 for the whole questionnaire. The data were collected and after coding, entered into spss software version 11.5. Then the data were analyzed with descriptive tests (mean- the

frequency distribution table - chart) and analytical tests (correlation - t-test).

**Results**

Results indicated 50% of the samples were medical students and the other 50% were public health students. 30% were male and 70% were female. The average age of students was (24.46±3.156).

Findings also indicated that 36.7% of public health students were in the third semester and 13.3% of them were in the fourth semester. 34.4% samples were medical students who were in their 12th semester and 15.6% were in their 14th semester (Fig.1).



**Fig1:** Distribution of semester in medical and health students

The mean score of knowledge about TB in public health students was (9.24±2.091) of total 20 scores and the mean scores of knowledge, diagnosis and treatment in those students was (16.91±3.168) of total 40 scores. The mean score of knowledge about TB in medical students was 8.67±1.954 of total 20 scores and the mean scores of knowledge, diagnosis, treatment of TB and DOTS in those students was 16.42±3.720 of total 40 scores (Table 1).

**Table 1:** The mean score of knowledge, diagnosis and treatment of TB in medical and public health students

Field of Study	Mean (SD) of knowledge	Mean (SD) of diagnosis and treatment
Public health	9.24±(2.091)	16.91±(3.168)
Medicine	8.67±(1.954)	16.42±(3.720)

Findings also indicated the mean scores of students' knowledge (medical and health students) in the prevention and treatment of tuberculosis was (8.96±2.033) of total 20 scores and the mean scores of students' knowledge (medical and health) about diagnosis, treatment of TB and DOTS was (16.67± 3.445) of total 40 scores. T test showed there were no statistically significant relationship between gender and academic fields, and the score of knowledge, diagnosis and treatment of TB in students, but women had more information than men (P>0.05).

Results showed there was a significant and linear correlation between the general and specialized amount of students' information about tuberculosis (Pearson correlation coefficient=0.681 and P=0.000). Findings also revealed there was no statistically significant relationship between students' age and the amount of information (public - Specialized) about TB (P> 0.05).

**Discussion**

TB is still one of the most important global public health threats. If global control of the disease does not improve, the annual global incidence is expected to increase from the current 21% to 61% by 2020 (20). Early detection and adequate treatment are critical control measures.

In this descriptive-analytical research, the rate of knowledge, diagnosis and treatment of TB and DOTS Strategy in 90 public health and medical students who were chosen by a stratified and a simple random method, was evaluated. The results showed that the mean score of health students' knowledge about TB and DOTS was less than mediocre (9.24±2.091) score

of 20. Findings also indicated that their knowledge was low ( $8.67 \pm 1.954$ ) score of 20. In the statute of medical colleges, matching the content of the educational programs with the health care needs of the country is announced as one of the goals of establishment of those universities. Article seven of the third chapter of the Statute states: "Medical school graduates must have the knowledge and skills needed to prevent and diagnose disease and treat patients with mental and physical illnesses"(11). Appropriate medical training and preparing physicians for proper and timely diagnosis and treatment, has been one of the goals in medical education. To achieve this goal, we must strive that the medical education is not only for the treatment of rare and refractory diseases in hospitals (11). Nasehi et al who are experts about TB stated that for reducing the duration of the health care system delay, which is a major part of overall delay in the diagnosis and treatment of patients, it is necessary for health care providers, especially private practitioners, to retrain diagnosis and treatment of this disease in regular intervals and it is required to integrate the topic of TB in medical and paramedical students' curriculum. It is needed to emphasize on the necessity of repeating smear tests and using chest radiographs in suspected patients if the disease symptoms are persistent. In addition, it is required to suspect TB in patients with a history of chronic respiratory diseases if their symptoms become exacerbated (13).

Findings showed that the mean scores of knowledge, diagnosis, treatment of TB in medical students was ( $16.42 \pm 3.720$ ) of total 40 and this scores in public health students was ( $16.91 \pm 3$ ) which indicates students' poor knowledge about TB and DOTS Strategy. These findings are compatible with Fadaeizadeh's (1), Talae's (2), Ayatollahi's (3), Jamshidi's (5), Ollé-Goig's (15) and

Kasraeian's (17) findings in poor information about TB in physicians and students. The studies conducted in other countries confirm the weakness of Physicians' knowledge about common infectious diseases. For example, in a study, which was conducted to investigate medical students' knowledge about TB, results has shown that only 30% of medical students were able to diagnose and treat TB patients. This issue led to a revision of TB education, so that after revision 90% of physicians had enough knowledge in the field of tuberculosis(15). Another study, which was conducted in Norway and England, in 1997, showed that the physicians' knowledge about tuberculosis has been very low (17). Medical Sciences is branch of Biological Sciences that its authorities are responsible for providing, maintaining and promoting the health of society. Medicine is a mixed of science, art and experience which is used in the diagnosis, treatment and prevention of diseases. When a physician starts working in medicine, faces with a job that has great values and responsibilities among other occupations and professions and therefore it is necessary for physicians to have sufficient and updated information about different types of diseases, especially infectious diseases. Findings revealed health students have more information about prevention and treatment of tuberculosis in comparison with medical students. However, there was no significant correlation between the field of study and the amount of knowledge about the disease, which is compatible with Ayatollahi's findings (4). On the other hand, it was not compatible with Majidpour's findings, which explained there were no significant correlation between the knowledge about TB and the variables like age and gender (5).

### **Conclusion**

In countries with high TB burden, it is important that all opportunities to raise population awareness about the disease are

used to the optimum. Medical and health students in universities can be exposed to TB infection during clinic rotations. Thus, adequate knowledge of TB epidemiology and control is critically important for this population. Knowledge of TB among medical undergraduates in university is also important since they represent potential future physicians or leaders in the fight against TB. According to the WHO, medical professionals should know about national and international expansion of the TB burden, national TB prevention policies such as control strategies, and the BCG vaccination recommendations. Knowledge of these topics was investigated in the present study and a poor level of knowledge was reported.

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#### **References**

1. World Health Organization. WHO Global tuberculosis report 2012. Available from: URL: [http://www.who.int/tb/publications/global\\_report/en/](http://www.who.int/tb/publications/global_report/en/)
2. Fadaeizadeh L, Nabipour I. The level of knowledge about TB in Bushehr city residents. *Iran J Infect Dis Trop Med* 2002;7(17):60-56.
3. Talaei H, Yadegari D, Shahid N. Knowledge of general practitioners of control and treatment TB with DOTS strategy: Necessity of its inclusion in the curriculum of medical schools. *Infect Dis Trop Med* 2002;7(18): 72-67.
4. Ayatollahi J. Knowledge and practice of two final year medical students' of chemoprophylaxis after exposure to infectious diseases. *Infect Dis Trop Med* 2004;9 (26): 59-54.
5. Majidpour A, Fuladi N, Faghih Zadeh S. Comparison study of knowledge, attitude and practice of Ardebil people about prevention and control of tuberculosis with smear positive patients. *Journal of Medical Council of Islamic Republic of IRAN* 2003; 21(2):142-137.
6. Jamshidi M, Hashemi SM. Knowledge of physicians in Bandar Abbas about Tuberculosis

- and DOTS. *Bimonthly Journal of Hormozgan University of Medical Sciences* 2001;5(2): 4-1.
7. Alavi SM, Sefidgaran Gh, Karami F. Comparative study on knowledge about tuberculosis in two cities with different tuberculosis epidemiological index in Khuzestan. *Jundishapur Scientific Medical Journal* 2009; 8(60):69-63.
8. World Health Organization: Global Tuberculosis Control: WHO Report 2012. WHO, Geneva: WHO/CDS/TB/2012. 275.
9. Mandell GL, Bennett JE, Dolin R. Principles and practice of infectious diseases. 6th ed. Philadelphia: Elsevier Churchill Livingstone; 2005:2852-3.
10. Chen J. Communicable diseases. Translated by Sabaghian H. Tehran, Pourcina 2001;724-30.
11. Malek Afzali H, Shadpour K. Study skills needed and job problems in medical doctors working in health centers. Presented at the National Seminar on Medical Education; Tehran: March 1994.
12. Jamaati HR, Mansuri SD, Zahedpour Anaraki MR, Mirsaeidi SM, Kazempour Dizji M, Eskandari M. Study of Factors in tuberculosis treatment failure. *Tanaffos Journal* 2003; 2(7): 68-61.
13. Nasehi M, Mohammad K, Gouya MH, Majdzadeh SR, Holakouie Naieni K. Investigation of factors affecting of delay the health care system in diagnosis and treatment of infectious TB. *Tanaffos Journal* 2003;2(8): 64-55.
14. Tavanaei Sani A, Nouri M. Success of the DOTS strategy and estimates of MDR-TB in Mashhad. *Infect Dis Trop Med* 2006;11(33): 25-21.
15. WHO tuberculosis site. WWW. WHO. [http://www.who.int/gtb/publication/TB-control\\_annex\\_1-htm](http://www.who.int/gtb/publication/TB-control_annex_1-htm) P 1-12.
16. Ollé-Goig JE, Cullity JE, Vargas R. A survey of prescribing patterns for tuberculosis treatment amongst doctors in a Bolivian city. *Int J Tuberc Lung Dis* 1999 Jan; 3(1):74-8.
17. Sadr Sh. Attitude of medical students towards their career. *Journal of Medical Council of Islamic Republic of IRAN* 1997; 16(3):216-212.
18. Kasraeian L, Sadeghi Hasanabadi A. Scientific knowledge of physicians in health center in Shiraz city about four infectious diseases (tuberculosis ,brucellosis ,typhoid and dysentery). *Iranian Journal of Medical Education* 2000; 1(2):35-33.
19. Rao SN1, Mookerjee AL, Obasanjo OO, Chaisson RE. Errors in the treatment of tuberculosis in Baltimore. *Chest* 2000 Mar; 117(3):734-7.
20. Dye C, Garnett GP, Sleeman K, Williams BG. Prospects for worldwide tuberculosis control under the WHODOTS strategy. *Lancet* 1998; 352:1886-91.