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Major article

Lack of optimum practice among health care workers regarding tuberculosis in Iran: A knowledge, attitude, and practice study

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Background: Lack of knowledge toward tuberculosis (TB) among health care workers (HCWs) increases the risk of developing TB. The aim of this study was to assess the level of knowledge, attitude, and practice of HCWs in Iran.

Methods: We conducted a cross-sectional study in 50 universities of medical sciences throughout Iran. A questionnaire was developed to assess the knowledge, attitude, and practice of participants. The values of Cronbach α coefficients for the knowledge and attitude questions were .76 and .75, respectively.

Results: The mean scores of knowledge, attitude, and practice among TB laboratory staff regarding TB was 82.6 (95% confidence interval [CI], 82.0-83.7), 87.6 (95% CI, 87.1-88.0), and 57.9 (95% CI, 56.9-58.9), respectively. The mean scores of knowledge, attitude, and practice among non-TB laboratory staff regarding TB was 69.5 (95% CI, 67.9-71.1), 50.7 (95% CI, 50.1-51.4), and 40.82 (95% CI, 38.2-43.4), respectively.

Conclusion: TB laboratory staff scored relatively well in knowledge and attitude of TB, but they scored lower in practice regarding TB. Non-TB laboratory staff had lower scores than TB laboratory staff in knowledge, attitude, and practice. There is a major gap between knowledge and attitude and practice in both groups. It is therefore essential to plan for the continuing in-service training of HCWs and public training of the general population regarding TB.

Tuberculosis (TB), one of the world's oldest diseases, is still one of the major killers among infectious diseases, and it is out of control in many parts of the world.[1] The World Health Organization declared TB as a universal emergency in 1993.[2] With the emergence and spread of multidrug resistance bacilli, it has been proposed that there will be the risk of the transformation of TB into an incurable disease.[3] Recent evidence on drug resistance warns that multidrug resistant and extensive-drug resistant TB are rapidly increasing.[4,5] It is estimated that in 2012, 8.6 million people fell ill with TB and 1.3 million died from TB. However, 95% of TB infection is believed to exist in an asymptomatic latent form, defined not by the identification of bacteria, but by a host immune response.[6] Ninety five percent of morbidity and 98% of deaths caused by TB occur in developing countries,[7] and TB remains a major public health problem in Iran.[8,9]

TB is considered an occupational disease among health care workers (HCWs).[10-12] Physicians, nurses in hospitals, and other HCWs, particularly TB laboratory staff, are at high risk for TB.[11,13] The relative risk of TB infection in HCWs has been reported to be approximately 3 times higher than other groups in the community.[14] The prevalence of latent TB among HCWs was reported

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between 2% and 47% in Iran.[12,15-17] Considering that HCWs, especially staff in TB laboratories, are at higher risk of latent and active TB compared with the general population, they should have appropriate knowledge, attitude, and practice (KAP) regarding transmission, prevention, and treatment of the disease.

Previous studies conducted in Iran indicate poor knowledge about TB among general physicians in the public and private health sectors,[18-20] but no study to our knowledge has been conducted to evaluate KAP about TB in laboratory personnel.

Lack of knowledge of TB among HCWs may contribute to an increased risk of developing TB.[21] Available evidence suggests that relatively simple interventions (eg, education and training of HCWs) might be effective in the prevention of TB among HCWs.[12] Evaluating the KAP of TB in laboratory staff is essential to plan educational programs for HCWs, including TB laboratory staff, in Iran. The aim of this study was to assess the level of KAP of this group in Iran.

MATERIAL AND METHODS

Study design

This study was a nationwide cross-sectional study performed from October-December 2013 in 50 universities of medical sciences covering all provinces in Iran. After the sample size calculation we arrived at a sample of 1,016, with .05 error level. All staff (689 individuals) who were working in TB laboratories, including technical staff (experts, associated technicians, technicians) and nontechnical staff (service and administrative personnel of TB laboratory) were included in this study. Another group consisting of 327 participants (almost half of the TB laboratories' personnel at each university, including administrative, finance, and service personnel) were also included in this study. We sent out 1,016 questionnaires and received 1,006 completed questionnaires returned; therefore, the response rate for both groups was 99%.

This study was approved by the Board of Ethics Committee at the Pasteur Institute of Iran. All participants enrolled voluntarily into the study and gave written, informed consent.

Developing the questionnaire

A researcher-designed questionnaire was developed according to the related scientific literature[22,23] and was based on expert opinion. A panel of experts in the fields of epidemiology and microbiology along with experts at the Iranian national TB office at the Center of Disease Control and Prevention at the Ministry of Health evaluated the validity of the questionnaire. The reliability of the questionnaire was assessed by conducting a pilot study on 30 people, including TB laboratory ($n = 15$) and administrative staff ($n = 15$), at the Pasteur Institute of Iran. The mean age $\pm$ SD of participants in the pilot study was 43.3 $\pm$ 8.3 years. The values of the Cronbach α coefficients for the knowledge and attitude questions were .76 and .75, respectively.

In the designed questionnaire, 44 questions were generated for addressing KAP among TB laboratory staff and 19 questions were generated for addressing KAP of non-TB laboratory staff regarding TB.

Because of different levels of education and responsibilities among the technical TB laboratory staff (experts, associated technicians, technicians) and nontechnical TB laboratory staff (service personnel, administrative staff), different types of practice questions for each group were designed. The TB laboratory staff questionnaire consisted of 4 sections as follows: (1) demographic variables (eg, age, sex, marital status, education level, job, responsibilities, history of work in a TB laboratory); (2) 11 three-choice questions related to knowledge regarding TB (true, false, I do not know), with a total score between 0 and 22; (3) 11 three-choice questions related to attitude toward TB (agree, no opinion, disagree), with a total score between 11 and 33; and (4) 17 questions related to the practice of TB among technical staff, with a total score between 0 and 34, and 15 questions related to practice of TB in service personnel and administrative laboratory staff, with a total score between 0 and 30. Six practice questions were related only to technical staff, and 4 questions were related only to service personnel and administrative laboratory staff. Twelve questions related to practice were asked to both mentioned groups in TB laboratories.

The non-TB laboratory staff's questionnaire also consisted of the following 4 sections: (1) demographic variables (same as the TB laboratory staff); (2) 11 three-choice questions related to knowledge of TB (true, false, I do not know), with a total score between 0 and 22; (3) 5 three-choice questions related to attitude toward TB (agree, no opinion, disagree), with a total score between 5 and 18; and (4) 3 questions related to practice of TB, with a total score between 0 and 5. Participants' scores of knowledge and attitude were calculated by totaling the assigned scores of all questions out of 100.

Statistical analysis

All analyses were conducted at the 5% significance level ($P < .05$) using Stata 11 (StataCorp, College Station, TX). Analysis of variance was used to compare the mean scores of KAP through the subgroups. The Scheffe test was used for post hoc analysis. A linear regression model was used to estimate the effect of knowledge and attitude on good practice regarding TB.

RESULTS

In this study we assessed the KAP of 689 TB laboratory staff and 317 non-TB laboratory staff (including administrative, finance, and services staff). The mean age of TB laboratory staff and non-TB laboratory staff was 38.06 $\pm$ 0.30 and 37.31 $\pm$ 0.41 years, respectively. Of the participants, 469 (68.7%) of TB laboratory staff and 227 (71.6%) of non-TB laboratory staff were men. The demographic characteristics of the 2 groups, including age, sex, education, and marital status, were not statistically different.

KAP were related to the demographic characteristics of the TB laboratory staff, but there was no statistically significant association between KAP and the demographic characteristics of non-TB laboratory staff ($P > .05$) (Table 1).

Knowledge of TB laboratory staff

Mean scores of knowledge regarding prevention of TB were 84.6 in women and 82.0 in men ($P = .01$). The knowledge was deferent among age groups ($P = .001$), and it was higher in the 32-41.9 years age group compared with the 42-51.9 years age group ($P = .003$). Marital status was not related to knowledge score ($P = .13$).

Education level was related to knowledge score ($P = .001$). The minimum score of knowledge belonged to elementary education, and the maximum score was related to the Masters of Science educated staff. According to post hoc analysis, the associate degree group had a higher score than the lesser educated groups ($P < .001$). The Bachelor of Science group had a higher score than the group with a diploma and lower level of education ($P < .001$). The Masters of Science group had a higher knowledge score than the associate and lower degree groups ($P < .001$).

The knowledge score was related to the job group ($P = .001$). The service personnel group had a lower score of knowledge than the