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Complex relation among Health Belief Model components in TB prevention and care

Z.T. Li ^{a,b}, S.S. Yang ^a, X.X. Zhang ^a, E.B. Fisher ^c, B.C. Tian ^d, X.Y. Sun ^{a,*}^a School of Public Health, Peking University, Beijing 100191, China^b Healthcare Department, Peking Union Medical College Hospital, Beijing 100005, China^c Gillings School of Public Health, University of North Carolina at Chapel Hill, NC 27599, USA^d Guozhong Health Education Institute, Beijing 100009, China

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ABSTRACT

Objectives: This study aims to explore the relationships among components of the Health Belief Model, tuberculosis (TB) preventive behavior, and intention of seeking TB care.

Study design: Cross section study.

Methods: Using convenience sampling, 1154 rural-to-urban migrant workers were selected between the ages of 18–50 years in six urban areas of three provinces in China. The survey was conducted by individual, face-to-face interviews with a standardized questionnaire. Lisrel 8.7 was used to conduct path analysis.

Results: The knowledge and benefits components of the Health Belief Model predicted preventive behaviors: cover nose/mouth when coughing or sneezing ($\beta = 0.24, 0.33$ respectively), evade others' coughs ($\beta = 0.13, 0.25$) and also predicted seeking TB care ($\beta = 0.27, 0.19$). Susceptibility and severity also predicted seeking TB care ($\beta = 0.12, 0.16$). There were also important relationships among model components. Knowledge of TB predicted both susceptibility ($\beta = 0.32–0.60$) and severity ($\beta = 0.41–0.45$). Further, each of susceptibility ($\beta = 0.30$) and severity ($\beta = 0.41$) predicted perceived benefits of preventive care.

Conclusion: Thus, a path from knowledge, through severity and susceptibility, and then through benefits predicted prevention and TB care seeking behaviors.

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Introduction

Tuberculosis (TB) remains one of the most significant threats to public health worldwide. During the last decades, TB

control in China has made remarkable progress, between 1990 and 2010, prevalence rates were halved, mortality rates fell by almost 80% and TB incidence rates fell by 3.4% per year.¹ However, because of its sheer population size, China still

* Corresponding author. Department of Social Medicine and Health Education, School of Public Health, Peking University, 38, Xueyuan Road Haidian District, Beijing 100191, China. Tel./fax: +86 10 82801743 804.

E-mail address: xysun@bjmu.edu.cn (X.Y. Sun).

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has the second highest burden of TB, behind only India, accounting for 11% of global total TB cases, as of 2013, there were approximately 0.9 million–1.1 million newly notified incident tuberculosis cases.²

The prevalence of tuberculosis in China is influenced by several factors, and the increase in migrants from rural to urban areas is one of the major challenges.³ China's rapid development of industrialization and urbanization created large-scale domestic migrations. According to the China's Migrant Population Development Report in 2010, there were about 211 million domestic migrants in China by 2009.⁴ It is estimated that there will be 240 to 260 million rural-urban migrants in China by 2030.⁵

Migrant workers, who leave their rural hometowns to cities and work there temporarily, usually dwell in the cities for several months in a year living in crowded houses with very poor conditions and are forced to move from one place to another frequently. They had a lower social and economic level, a limited knowledge of tuberculosis,⁶ and a higher risk of tuberculosis than local residents.^{7,8} Moreover, tuberculosis patients among rural-to-urban migrant workers had low access to tuberculosis care^{6,9} and poor treatment outcomes^{10,11} and high drug resistance rates.¹²

In China, the major types of insurance include the Urban Employee Basic Medical Insurance (UEBMI) that covers the urban formal sector employees, the Urban Resident Basic Medical Insurance (URBMI) that targets on the urban workers in the informal sector and the non-employed urban residents and the New Rural Cooperative Medical Scheme (NRCMS) that insures the large rural population. Usually, rural-to-urban migrant workers join NRCMS in their hometowns, but it is not convenient for them to use when they get sick in cities, on the contrary, they need to pay the treatment and care by themselves. Compared with urban residents, rural-to-urban migrant workers are often lack of medical insurance and are in a disadvantage position in access to health care because of the low income. In Zhou's study, 65% of the migrant TB patients in Shanghai did not have any kind of health insurance¹³ and in another study among migrants population in East China, only 6.5% of new pulmonary tuberculosis cases had medical insurance.⁴ The situation is worse as the cost of medical care has risen dramatically in recent years. Fortunately, Chinese government has a free policy for TB diagnosis and treatment available at designated TB dispensaries, but less rural-to-urban migrant workers knew the policy than urban residents.¹⁴ The municipal TB control centers are facing great challenges in treating and monitoring tuberculosis cases of floating population. With the increasing number of floating population and their special and most importantly difficult situation, it is of great importance to understand, and in order to improve their TB prevention behavior and medical intention.

In this research, Health Belief Model (HBM) was applied to understand the determinants of preventive behavior and intention of health seeking. HBM was one of the first models used for TB research, and remains one of the best known health behavior models, which is widely used in health-related behavior change analysis.¹⁵ The HBM suggests that your belief in a personal threat together with your belief in the effectiveness of the proposed behavior will predict the

likelihood of that behavior.¹⁶ Individual perceptions related to such factors as personal perceived susceptibility, perceived severity, perceived benefits of an action and its barriers represent important predictors of preventive TB behavior. In the field of tuberculosis, researchers have applied HBM to patients screening, treatment, prevention and health education. Chang applied the Health Belief Model to analyze intention to participate in preventive pulmonary tuberculosis chest X-ray examinations among indigenous nursing students in Taiwan.¹⁷ Poss studied the participation in tuberculosis screening of Mexican migrant farm-workers.^{18,19} Rodríguez-Reimann investigated gender and acculturation differences in TB-specific Health Belief Model constructs, and the applicability of the HBM's traditional configuration to Mexican Americans.²⁰ Wyss using the HBM and social cognitive theory to interpret beliefs in migrants diagnosed with latent TB, discussion of the research findings describes environmental, cognitive, and social factors that were barriers to screening, diagnosis, and treatment.²¹ However, it is hard to find a study using HBM in TB control field in China.

In the present study, HBM was used to analyze TB related behavior among rural-to-urban migrant workers in China. The purpose of this current study is to analyze the factors that affect the migrant workers' TB prevention behavior and health seeking intention, in order to improve the behavior of the migration and provide TB-related health recommendations. Path analysis, as a form of multiple regressions focusing on causality, usually being used to describe the directed and undirected dependencies among a set of variables, was utilized to examine complex relationships among predictive factors, prevention behaviors and health seeking attitudes in this study.

Methods

Sample and setting

In 2011, a cross-sectional survey was conducted in three provinces in China. Multistage sampling was employed. At the first stage-province level, Shandong, Shanxi and Hubei were selected, which represented Eastern China, North China and Central China, respectively. Then, two cities were selected in each province. At the third stage, cluster sampling was used in two or three places where rural to urban migrant workers gathered, including hotels, building sites, and assembly shops. The sample size was calculated by the function $n = Z^2_{1-\alpha/2} P(1-P)/d^2$. According to data obtained from the survey on the awareness rates of key messages on TB prevention and cure knowledge among national public in 2006, the expected percentage was 48.9% ($P = 0.489$). The minimum sample size was 1067. Considering recovery rates and efficiency rates of the questionnaire, the actual sample size should be at least 1190. The number of samples in each city was about 200. The samples of rural-to-urban migrant workers were required to be between 18 and 50 years old, in China household register system, which domicile places were in rural areas but at the survey time point, they were living and working in cities. In fact, 1320 questionnaires were distributed, 1280 returned, and 1274

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