



Tuberculosis infection control in a high drug-resistance setting in rural South Africa: Information, motivation, and behavioral skills

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Summary

Background: Tuberculosis (TB) is transmitted in resource-limited facilities where TB infection control (IC) is poorly implemented. Theory-based behavioral models can potentially improve IC practices.

Methods: The present study used an anonymous questionnaire to assess health-care worker (HCW) TB IC information, motivation, and behavioral skills (IMB) and implementation in two resource-limited rural South African hospitals with prevalent drug-resistant TB.

Results: Between June and August 2010, 198 surveys were completed. Although the respondents demonstrated information proficiency and positive motivation, 22.8% did not consider TB IC to be worthwhile. Most tasks were rated as easy by survey participants, but responding HCWs highlighted challenges in discrete behavioral skills. The majority of responding HCWs reported that they always wore respirators (54.3%), instructed patients on cough hygiene (63.0%), and ensured natural ventilation (67.4%) in high-risk areas. Most respondents (74.0%) knew their HIV status. Social support items correlated with the implementation of the first three aforementioned practices but not with the respondents' knowledge of their HIV status. In most cases, motivation and behavioral skills, but not information, were associated with implementation.

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Conclusion: HCWs in rural South African hospitals with high drug-resistance demonstrated moderate IMB and implementation of TB IC. Improvement efforts should emphasize the development of HCW motivation and behavioral skills as well as social support from colleagues and supervisors. Such interventions should be informed by baseline IMB assessments. In the present study, a trimmed/modified IMB model helped characterize TB IC implementation.

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Introduction

Tuberculosis (TB) is often transmitted in health-care facilities [1,2]. Nosocomial TB transmission in resource-limited settings causes high morbidity and mortality, especially in the current era of HIV and multi- and extensively drug-resistant TB (M/XDR-TB) [3]. Nosocomial transmission also undermines TB control [4] and endangers healthcare workers (HCWs) [5].

TB infection control (IC) can prevent nosocomial transmission in resource-limited settings [6,7], but TB IC is poorly implemented in the developing world [8,9].

TB IC implementation and research could benefit from the inclusion of behavioral approaches [3]. These strategies have been shown to increase the implementation of health policies [10]. Behavioral models describe actions by characterizing their causes and correlates, thereby identifying potential avenues for behavioral changes and guiding the development, monitoring, and evaluation of interventions [11].

The information–motivation–behavioral skills (IMB) model (Fig. 1) states that well-informed, motivated individuals develop necessary behavioral skills, which lead to effective practices [12]. This model has been useful in characterizing and enhancing HIV risk reduction behaviors [13–15], antiretroviral therapy adherence [16–18], and diet and exercise [19]. We hypothesized that the IMB model could characterize HCW TB IC adherence and inform IC enhancement.

Methods

Setting

The present study was conducted at two resource-limited rural district hospitals in Umzinyathi district, KwaZulu-Natal, South Africa. Church of Scotland Hospital (COSH) is a 350-bed facility in Tugela Ferry with documented nosocomial TB and M/XDR-TB [20,21]. Charles Johnson Memorial Hospital (CJMH) is a similarly sized facility in Nqutu. At

the time of this study, COSH had an appointed IC officer, had implemented a TB IC policy, and had already conducted some minor TB IC staff training two years earlier, which consisted of a half-hour long information-based lecture to a few dozen staff members. CJMH had two IC officers but no TB IC policy or formal staff training. TB and MDR-TB incidence rates in Tugela Ferry are 1100/100,000 and 140/100,000, respectively. Although precise numbers are not available, we presumed that Nqutu bears a similar TB and MDR-TB burden as Tugela Ferry. In 2009, the antenatal HIV prevalence in Umzinyathi district was 28.2% [22]. COSH was chosen for the present study because of its high burden of HIV, TB and M/XDR-TB. CJMH was chosen because of its comparability with COSH (in terms of size, resources, level of care, patient population, and disease burden), the receptivity of its administration to this study, and its relative geographic proximity to COSH (CJMH is the only district hospital in the neighboring Nqutu sub-district).

Questionnaire

The questionnaire was based on a proposed TB IC IMB model and adapted from an instrument that was previously used at COSH [23]. The questionnaire was piloted for clarity by Zulu staff from an affiliated organization. The survey was anonymous, English, paper-and-pencil, and 45 min long. All clinical staff members who worked day shifts during the study period in high-risk departments of the hospitals (medical and TB wards and outpatient, antiretroviral, and TB clinics) were asked to participate. Questionnaire participation was voluntary, and written informed consent was acquired. The study was deemed complete when all available staff members had been surveyed.

The survey assessed demographics, TB IC IMB, facility-wide implementation of several TB IC tasks, self-reported personal TB IC practices, and attitude questions about the effects of staff TB deaths and perceived managerial efforts to protect HCWs. Survey questions were presented in the following formats: yes/no, true/false/do not know, and a 5-point Likert scale.

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