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Barriers and Facilitators Affecting Tuberculosis Infection Control Practices of Russian Health Care Workers

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SUMMARY

Setting—Five inpatient and outpatient tuberculosis care facilities in two regions of Russia. Objective: To identify barriers and motivators to use of infection control measures among Russian TB health care workers.

Design—In this qualitative study, a convenience sample of 96 HCWs was used to generate 15 homogeneous focus groups consisting of physicians, nurses, lab staff, or support staff.

Results—Barriers and motivators related to knowledge, attitudes and beliefs, and practices were identified. Three main barriers were a) knowledge deficits, including the belief that TB was transmitted by dust, linens, and eating utensils; b) negative attitudes related to the discomfort of respirators; and c) practices with respect to quality and care of respirators. Education and training, fear of infecting loved ones, and fear of punishment were the main motivators.

Conclusions—Our results point to the need for evaluation of current educational programs. Positive health promotion messages that appeal to fear might also be successful in promoting use of TB infection control. Individualized rewards based on personal motivators or group rewards that build on collectivist theory could be explored.

Keywords

barriers; facilitators; health care worker; infection control; tuberculosis

Occupational tuberculosis (TB) infection is a risk faced by health care workers (HCWs) in TB facilities. This risk for Russian HCWs is up to 60 times higher than for the general population[1] and 10-20 times higher than for HCWs not employed in TB settings.[2] The increased risk can be attributed to a number of factors including lack of knowledge about and failure to use infection control (IC).[1,2,3]

Woith et al.[4] examined Russian HCWs' knowledge of TB and IC and found gaps. Although lack of knowledge can increase risk of occupational TB infection,[5] having knowledge does not necessarily translate into safe practice.[6,7] However, there is a lack of research exploring barriers and motivators affecting safe practice, including use of IC measures, among Russian HCWs.

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The purpose of this study was to identify barriers and motivators to use of IC measures among Russian HCWs. We used a community-based participatory approach that included a 10 member Community Participatory Team (CPT) comprised of Russian physicians, nurses, lab staff, and support staff working in TB settings.[4] The CPT's roles were to aid in instrument development and ensure that the project was culturally appropriate.

STUDY POPULATION AND METHOD

Setting and Sample

The study was conducted in three TB hospitals and two outpatient TB clinics, located in urban and rural settings, in two regions of Russia (Table 1). The study was open to any HCW age 18 or older at the study sites. A convenience sample was recruited through flyers posted on-site and from recruiting announcements at staff meetings. Dates, times, and job category for focus groups were posted and those interested attended the appropriate session.

Procedure

Fifteen homogeneous focus groups were formed with physicians (n=26), nurses (n=37), lab staff (n=12), or support staff (n=21); group sizes ranged from two to ten (Table 2). We included results from a small focus group consisting of two physicians as there were only three physicians employed at that facility and their perceptions of the phenomena were important to the study. All groups were asked the same questions, but probes varied based on responses. Sessions lasted 1-1 ½ hours.

Open-ended questions were designed to generate discussion about: the disease process of TB, including how TB is transmitted and when a person is infectious; what IC methods were used and when these were used; and what barriers and motivators existed to use of infection control. Questions were written in English and translated into Russian by a bilingual Russian physician who specializes in TB.

Discussions were led by three Russian research assistants: a facilitator who posed questions and two note-takers. Field notes, translated into English, captured discussions and observations about participants. The research team and Primary Investigator met after each focus group and on two other occasions to review notes for accuracy, thoroughness, and interpretation from educational and cultural perspectives. All research assistants participated in a three-day training session which included mock focus groups to prepare them for these roles.

Protection of Human Subjects

Institutional Review Boards at two universities in the U.S. and the Chief Physicians of the participating programs approved the study. Informed consent was obtained from all participants.

Data Analysis

Data were analyzed manually by coding clustered responses into themes. Members of the research team reviewed themes for agreement.

RESULTS

Ninety-six HCWs (females=89, males=7) participated in the study. Eighty-five percent were 35 or older. Eighty-five percent worked in TB care facilities 10 years or longer. Results are divided into two categories: barriers to and motivators of IC use. Within these categories, results are further divided into knowledge, attitudes and beliefs, or practices.

There were operational differences between Regions A and B. Participants in Region A stated they did not have respirators due to insufficient finances; instead, they wore masks. Responses about mask use mirrored responses in Region B regarding respirator use. In Region A, continuing education was based on materials provided by the Health Ministry while in Region B it was based on World Health Organization and Centers for Disease Control and Prevention materials. However, responses to questions about TB disease, transmission, and IC revealed no major differences in knowledge or beliefs between regions. Another difference was that hospitals and clinics in Region B were separated into risk zones. High risk zones included units housing smear-positive and multi-drug resistant patients, departments where high risk procedures such as bronchoscopy were performed, and sections of the lab. The hospital in Region A was not separated into risk zones.

Barriers

Knowledge—Physicians and nurses were most knowledgeable about TB and TB IC while support staff were least knowledgeable. However, there were knowledge deficits among all categories of workers. Some physicians noted TB was caused by a fungus or was a cross between fungus and bacteria. Although all groups knew TB was airborne, several other routes of transmission were described. Participants in each discussion group stated TB could be transmitted through contaminated meat and milk and by contact with “objects of personal hygiene and eating utensils.” Nurses and support staff were more likely to believe TB could be transmitted via laundry. Nurses from Hospital 1 noted dust and pollen can transmit TB, and stated “Tuberculosis can be spread through sexual transmission, although this seldom occurs.” Support staff believed TB was blood-borne. Participants in all job categories and all settings believed wearing hospital-laundered lab coats and disposable shoe coverings was protective against transmission. Participants also described the necessity of showering and changing clothes so they did not carry the bacillus home. Other gaps in knowledge included the belief that prolonged exposure to cold increased susceptibility and a full stomach was protective against infection. “We eat well before going to examine patients because then the infection can’t survive” (Physician, Hospital 2).

Attitudes and beliefs—Many HCWs voiced negative attitudes about the use of respirators and masks because they are uncomfortable and this was seen as a major barrier to their use. Frequently cited problems included “respirators sliding down the nose and requiring constant repositioning,” and respirators “are difficult to wear when the wearer has rhinitis,” “cause the face to perspire,” and “are unattractive.” Many also stated respirators and masks were especially uncomfortable during hot weather. Others mentioned glasses fogging as problematic. Wearing respirators interfered with using microscopes in the lab. Respirators and masks were seen as barriers to talking with patients, especially those who were hard of hearing and relied on lip-reading.

Workplace culture was another reason for not following IC measures. One Hospital 1 support staff described moving from caution to carelessness in the work setting, “For the first six months working here, everyone is afraid of getting TB. Then there is a feeling of complacency, we are afraid of nothing.” Another noted their work becomes habit and they forget. Others described a fatalistic attitude, “It is the culture of the Russian nation. If you are going to get TB, you will get TB” (Nurse, Clinic 1).

Practices—Participants sometimes attributed their practice of not using respirators to the poor quality of the respirators available at their facilities. For example, in facilities where respirators were available, one physician who worked in a high-risk setting wore a surgical mask around her neck, and several participants wore or carried masks to discussion groups but described the importance of wearing respirators. They cited the low quality of some

brands as a reason for not wearing them. Specifically, participants said the elastic strips which secure the respirator to the face tore easily, the inside surface flaked or crumbled, and fit was a concern. “The fabric is stiff and because of that there is not a good fit to the bridge of the nose” (Nurse, Hospital 3). Two participants reported allergies to materials in some of the respirators. Respirators were not available at Hospital 1 because of cost. In settings where respirators were available, brands changed based on cost and availability.

Practices for maintaining respirators further contributed to the problem. In some institutions, respirators were worn from one to four weeks and changed as needed, described as when they “are dirty or damaged,” “are expired,” or “no longer fit.” Respirators used in high-risk zones were changed more frequently. For ease of accessibility, respirators were carried in pockets or worn around necks and stored during non-working hours in a towel, a box, or the bag in which they were packaged (including plastic). Respirators were sometimes placed under UV lamps for disinfecting. Participants at Hospital 1, where respirators were not available, described changing masks several times a day. Masks were worn around necks or kept in pockets when not in use.

Motivators

Knowledge—Participants explained that new employee orientation and continuing education were available and emphasized the value and importance of education. “Professional knowledge and skills should be on a high level” (Lab Staff, Hospital 1). Educational programs included information on IC protocols and annual fit-testing (for HCW in Region B). Participants believed these programs helped them better understand the need to use IC measures.

Attitudes and beliefs—Fear of infecting loved ones was the main motivator across all categories of worker in all settings. “We fear spreading the disease to our families, children, and grandchildren” (Physician, Hospital 2). Some noted that seeing colleagues become infected also motivated them.

Loss of benefit payments was another fear expressed by participants in Region B. “If we don’t wear them [respirators], we can be deprived of benefit payments” (Support Staff, Hospital 3). One tactic commonly used to instill adherence to IC policies was to have the offender meet with the Chief Physician, who wrote the offender’s name in a ledger and placed it in a locked cabinet. The Chief Physician explained to the PI that benefits would not really be withheld, but the belief that this might happen, the official meeting, and formal noting of names were strong incentives to adhere.

Many participants followed IC measures to keep themselves healthy. “It is a personal belief and moral responsibility” (Physician, Hospital 2). Support staff at Hospital 1 noted, “We are old Soviet school – if you don’t take care of yourself, nobody will.” Verbal and visual reminders by peers also motivated use of IC. Participants stated they would remind each other to wear their respirators if they saw a colleague without one in high-risk zones.

Practices—Supportive behavior by institutional administrators promoted the use of IC measures. The practice by administrators of making rounds on the units and offering words of encouragement was perceived as being supportive of staff. “The administrators come to see us and they offer encouragement to follow IC policies” (Nurse, Hospital 2).

DISCUSSION

Summary of Key Findings

In this study, we identified major barriers and motivators to use of TB IC for Russian HCWs. The main barriers were knowledge deficits, negative attitudes related to the discomfort of respirators, and practices with respect to quality and care of respirators. Education and training, fear of transmitting TB to loved ones, and fear of punishment were the main motivators.

It is important to note that operational differences existed between the regions and one of these differences affected use of IC because respirators were not available; staff in this setting used surgical masks instead and their responses to barriers and motivators to use of masks mirrored those of staff where respirators were available.

Comparison of Findings with Other Studies

Participants in both regions received ongoing education, including annual training on TB and IC. Participants in Region B also received training on respirator use and fit-testing, yet some still did not wear respirators in high risk zones. Our findings are similar to those in other countries where knowledge alone was insufficient to produce desired practice.[3,6] Other gaps in knowledge were identified at all sites. Participants understood TB is airborne, but they also described routes not associated TB. Poor understanding of transmission may contribute to lower adherence to IC measures, as reported elsewhere.[7] Lack of knowledge also led HCWs in our study to implement measures that have no demonstrated effectiveness in preventing TB transmission.

Administrative and environmental controls are the most effective methods for containing risk,[5,8] and staff education is an important component of administrative control. Although curricula in physician and nurse preparation programs contain content on TB IC, and HCWs in this study received education during orientation and continuing education programs, there were still misconceptions about TB. This finding points to a need for review of curricula. Still, HCWs valued the education they received and believed these programs important to their work. As value is one key determinant of behavior,[9] correct knowledge may affect attitudes and help improve practice, as found elsewhere.[10]

Personal respiratory protection is needed to protect HCWs in high-risk zones,[5] but comfort and quality of respirators were primary barriers to their use. Participants noted variability in fit and comfort between different brands; this supports findings by Radonovich et al.[11] Proper fit is necessary to decrease risk of occupational TB,[12] but if respirators are uncomfortable, HCWs are unlikely to wear them.

Participants did not always follow manufacturers' instructions for respirator care. Respirators were improperly stored and carried. It is difficult to know from our results if this was a problem with knowledge, practice, or both. As little research exists on safe storage and reuse of respirators,[13,14] this should be explored more fully since improper care may disrupt respirator fit and integrity. Participants stated respirators were reused until damaged or dirty. Respirators were not physically examined in our study, but another study found HCWs continued to wear respirators even when these were dirty, damaged, or moist.[15]

Fear was the biggest motivator to use of IC methods, primarily related to HCWs' concern they would infect loved ones. Fear of transmitting TB has been described by others,[16,17] but these other studies did not address HCWs' concerns of transmitting disease to family and friends. Messages that evoke fear have been used in campaigns to change attitudes and promote health behavior, and positive messages are more successful than negative messages

especially when they combine visual and text components.[18,19] A campaign that promotes use of IC by targeting HCWs' fear of transmitting tuberculosis to family members might be successful here.

Participants also reported fear of punishment motivated use of IC. Russian employers have historically used fines and punishment to provide incentive,[20] and our findings showed this practice continues. Group pressure may help foster adherence, and rewarding the group for adherence would build on traditional collectivist approaches where the good of the group motivates worker behavior.[21] For this same reason, peer group interventions may be effective in promoting changes in health behavior. [22] Behavior change is also affected by perceptions of how others think one should behave. [23] In our study, participants described prompting each other to use respirators. Modeling is another means of producing behavior change, and using respected colleagues to model desired behavior could improve the likelihood of change.[24]

Participants described the impact of workplace cultural beliefs on their decision to use IC. Workplace culture is linked to human resource development, which is critical for success of IC plans.[25,26,27] However, cultural beliefs are less tangible than other barriers and may be more difficult to change.

Strengths and Limitations

A limitation of this study was the use of a self-selected sample. Another limitation was the language barrier between the Primary Investigator and the research team and participants; however, use of a translator facilitated understanding. Although generalizability is limited, conducting focus groups in rural and urban areas and in two different regions helped improve this. Including more focus groups in Region A would have further improved generalizability.

CONCLUSIONS

Occupational TB is a multifaceted problem and prevention requires understanding HCWs' perceptions of the issues. This study adds to the understanding of Russian HCWs' knowledge of TB and their perceptions of barriers and motivators to use of TB IC measures. Our results point to the need for evaluation of current educational programs, and TB program administrators in these regions might consider implementing curricula based on social cognitive theory, incorporating role models and mentoring. Positive health messages, which have been successful in promoting health-related behavior change elsewhere, might be successful in promoting use of TB IC. Wise investment of limited resources is necessary to make the most of available funds and a creative evaluation of budgets could result in elimination of unnecessary expenses; however, administrators might also consider the impact of resource redistribution on employee satisfaction. Finally, individualized rewards based on personal motivators or group rewards that build on collectivist theory could also be explored.[28]

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Table 1

Description of Study Sites

	Number of HCWs	Number of beds	Number of hospitalized TB patients
Region A: Hospital 1	~600 *	500	2000
Region B: Hospital 2	164	160	946
Region B: Hospital 3	77	100	349
Region B: Clinic 1	34	0	0
Region B: Clinic 2	57	0	0

* 40% vacancy in some job categories

Table 2

Participating Health Care Workers by Site

	Physician M/W	Nurse M/W	Lab M/W	Support Staff M/W	Totals M/W
Region A: Hospital 1	1/2	0/8	0/6	3/3	**4/19**
Region B: Hospital 2	0/10	0/8	0/6	0/8	**0/32**
Region B: Hospital 3	2/0	0/7	0/0	0/7	**2/14**
Region B: Clinic 1	0/5	0/8	0/0	0/0	**0/13**
Region B: Clinic 2	1/5	0/6	0/0	0/0	**1/11**
Totals	**4/22**	**0/37**	**0/12**	**3/18**	**7/89**
	26	**37**	**12**	**21**	**96**