

Developing an Instrument to Study the Tuberculosis Screening Behaviors of Mexican Migrant Farmworkers.

Developing an Instrument to Study the Tuberculosis Screening Behaviors of Mexican Migrant Farmworkers

JANE E. POSS, DNSc, ANP
University of Texas at El Paso

This article details the use of qualitative data in the construction of a Spanish-language, quantitative research instrument designed for a study of Mexican migrant farmworkers' participation in tuberculosis screening. In the qualitative study, 19 Mexican migrant farmworkers were interviewed in Spanish to elicit their explanatory models (EMs) about tuberculosis. The Tuberculosis Interview Instrument (TII) was developed from the results of the qualitative study and concepts from a theoretical framework consisting of a combination of the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA). After its development, the TII was subjected to translation and back-translation procedures to insure the equivalency of the English and Spanish versions, and it was reviewed for content validity. Internal consistency reliability, based on the responses of 206 subjects, was satisfactory for all subscales. Future testing of the TII is recommended to evaluate its stability among Mexican migrant farmworkers in other parts of the United States.

Although qualitative and quantitative research methods may have different philosophical underpinnings and may be invoked to answer different research questions, there are many areas of overlap between the two methodologies. Because they offer varied perspectives on a given research problem, it may be advantageous to integrate qualitative and quantitative methods to provide a more comprehensive approach to the study of complex phenomena (Dzurec & Abraham, 1993; Goodwin & Goodwin, 1984; Morse, 1991). Methodological triangulation, the integration of different methods to study a given research problem, is gaining an increasing numbers of adherents among nursing researchers, because this approach can produce a richer analysis of compli-

cated issues (Breitmayer, Ayres, & Knafl, 1993; Connelly, Bott, Hoffart, & Taunton, 1997; Morse, 1991).

Instrument development can be approached in many ways. One method that has been advocated by some researchers is to use qualitative data to develop, refine, or validate the instruments used in a quantitative study (Kimchi, Polivka, & Stevenson, 1991; Knafl & Howard, 1984; Polit & Hungler, 1995). The use of qualitative data can help to enhance the content validity of a quantitative instrument (Tilden, Nelson, & May, 1990). Examples of this approach include the incorporation of ethnographic studies to adapt standardized scales for a cross-cultural study in Jamaica (Dreher & Hayes, 1993), the use of qualitative data to validate a family screening instrument (Friedemann & Smith, 1997) or to adapt standardized scales for a specific patient group (Bennett, Milgrom, Champion, & Huster, 1997), and the application of qualitative focus group data to refine a standardized scale for use with impoverished minority women (Nyamathi & Flaskerud, 1992).

TUBERCULOSIS IN MIGRANT FARMWORKERS

The epidemic of tuberculosis among the nation's estimated 4 million migrant and seasonal farmworkers is an important public health issue. Migrant farmworkers have more health problems and suffer from infectious disease more frequently than the general population (Dever, 1991; Goldsmith, 1989; Rust, 1990; Slesinger, Christenson, & Cautley, 1986). Studies have documented rates of positive tuberculosis skin tests as high as 37% on the peninsula shared by Delaware, Maryland, and Virginia (Jacobson, Mercer, Miller, & Simpson, 1987); 41% in North Carolina (Ciesielski, Seed, Esposito, & Hunter, 1991); 44% in Florida (Centers for Disease Control, 1992); and 48% in Virginia (Centers for Disease Control, 1986).

Because migrant farmworkers are at high risk for tuberculosis, it is important to ensure that they receive appropriate screening, diagnostic studies, and treatment. Diagnosing and treating tuberculosis is especially difficult in migrant

farmworkers because of their highly mobile existence. Tuberculosis screening requires the administration of a purified protein derivative (PPD) skin test that must be read after 48 to 72 hours. Treatment for tuberculosis infection requires 6 to 9 months of uninterrupted, carefully monitored chemoprophylaxis. A review of the literature reveals that, to date, no studies have examined factors associated with the participation of migrant farmworkers in tuberculosis screening programs.

PURPOSE

The purpose of this article is to detail the construction of a Spanish-language, quantitative research instrument used in a study of Mexican migrant farmworkers. The purpose of the quantitative study was to analyze the relationship between variables from a framework comprised of the HBM and TRA and participation of migrant farmworkers in a tuberculosis screening program.

Researchers often approach the study of persons from different cultural backgrounds by using existing instruments and simply translating them into another language. This approach may produce a linguistically, but not necessarily a culturally, appropriate research instrument. This study describes how the findings of qualitative research may be incorporated into the instrument development process in an attempt to ground instrument items in the real-life views of the population being studied, which in this case is migrant farmworkers.

THEORETICAL FRAMEWORK

The HBM and TRA have been used frequently in health care research. The HBM was developed in the 1950s to explain preventive health behavior (Rosenstock, 1960, 1966, 1974b). The model postulates that for individuals to participate in screening, they must believe that (a) they are susceptible to an illness (susceptibility), (b) contracting the illness would have a negative impact (severity), (c) taking a particular action would be beneficial by reducing the threat of illness (benefits), and (d) taking action would not involve overcoming barriers (barriers). The presence of an internal or external stimulus (cue to action) is postulated to trigger health behavior.

The TRA was introduced in 1967 by Fishbein and further developed by Fishbein and Ajzen (1975). According to this theory, behaviors that are under volitional control are the result of intention. Intention is determined by the attitude toward the behavior and the subjective norm. Attitude is a person's overall evaluation of performing a behavior, whereas subjective norm is the perception of social pressures to act. A person's attitude toward a behavior is, in turn, determined by (a) the belief that a given outcome will occur if he or she performs the behavior and (b) the evaluation of performing the behavior. The subjective norm is determined by a person's beliefs about what particular salient individuals want

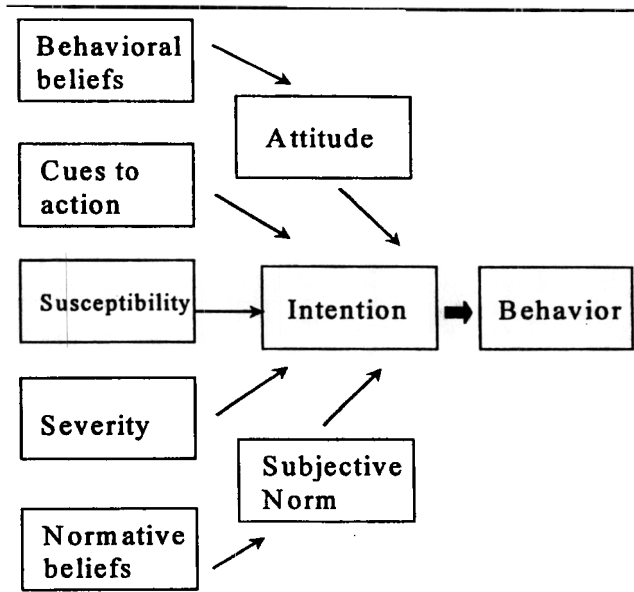


FIGURE 1. Combined HBM and TRA

him or her to do and the motivation to comply with these referents.

The HBM and TRA have a number of characteristics in common. Both are based on a value-expectancy theory of behavior and posit that beliefs about behavioral consequences predict behavior. When the HBM and TRA are integrated to form a new model, several concepts can be combined to maintain parsimony. The concepts, *barriers* and *benefits*, from the HBM are equivalent to *behavioral beliefs* from the TRA. The combined HBM and TRA is shown in Figure 1 to provide a visual model of the framework that guided the incorporation of qualitative data into the development of the quantitative instrument.

THE QUALITATIVE STUDY

The quantitative instrument, the TII, was developed based on data from a qualitative study of Mexican migrant farmworkers' EMs about tuberculosis. The findings of the qualitative study (Poss, 1998) are reported elsewhere.

EMs are notions about an illness that allow persons to make sense of the illness within a cultural context (Kleinman, 1980). The study of EMs focuses on the individual's explanation of the etiology, symptoms, severity, social significance, and treatment of a particular illness. EMs are not static, rather, they may change over time as new illness experiences, new knowledge, or other events produce modifications in an individual's conception about an illness.

By basing items for the quantitative instrument on notions about tuberculosis expressed by migrant farmworkers in the qualitative analysis, it was felt that items would have increased relevance and cultural fit for the subjects. In

addition, the developers of the TRA recommend developing instruments based on previously elicited behavioral and normative beliefs using a "free-response format" (Ajzen & Fishbein, 1980, p. 63).

Research about EMs has appeared primarily in the anthropology and nursing literature. The few investigations of EMs about tuberculosis among Hispanics showed that, in many cases, individual's models about tuberculosis have factors in common with the Western biomedical model of this disease (Ailinger & Dear, 1997; Poss, 1998). Research in other countries, however, revealed varying explanations of tuberculosis etiology, symptoms, treatment, and significance in India (Barnhoorn & Adriaanse, 1992), Pakistan (Liefoghe, Michiels, Habib, Moran, & De Muynck, 1995), Honduras (Mata, 1985), South Africa (Metcalf, Bradshaw, & Stindt, 1990), and the Philippines (Lieban, 1976; Nichter, 1994).

The study of EMs has been applied to diabetes among Mexican Americans (Eid & Kraemer, 1998; Hunt, Valenzuela, & Pugh, 1998; Luyas, 1991), Caucasian Protestants in the United States (Cohen, Tripp-Reimer, Smith, Sorofman, & Lively, 1994), and in an Anishinaabe community in Canada (Garro, 1995). Blumhagen (1980) examined EMs among patients diagnosed with high blood pressure and found that a majority of individuals believed that they suffered from an illness called hyper-tension, which is characterized by excessive nervousness produced by social stress. Other comparisons of patient's and health practitioner's EMs about specific illnesses revealed widely divergent interpretations between the two groups (Cohen et al. 1994; Helman, 1985).

A group of investigators applied the concept of EMs to examine intracultural and intercultural variations in the beliefs of Latinos living in the diverse communities of Hartford, Connecticut; Edinburg, Texas; Guadalajara, Mexico; and rural Guatemala. These researchers used the cultural consensus model to compare beliefs about diabetes (Weller et al., 1999) and *empacho*, a folk illness, (Weller, Pachter, Trotter, & Baer, 1993) among the four groups and found a high degree of consistency within and between groups. In both studies, the authors relied on data from earlier qualitative studies, ethnographies, and interviews to develop the quantitative questionnaires used in the research.

The qualitative study of Mexican migrant farmworkers' EMs of tuberculosis was conducted in the summer of 1996. After obtaining approval from the Human Subjects Review Committee (HSRC) at the researcher's academic institution, 26 Mexican migrant farmworkers were interviewed using a 19-item, open-ended interview instrument. Study participants included 21 males and 5 females. The ages of the respondents ranged from 18 to 65 years, with an average age of 27 for the males and 36.4 for the females. Twenty-five participants requested to be interviewed in Spanish, whereas one preferred English. Respondents had worked as migrant

farmworkers an average of 10 years, with a range between 1 and 32 years. The place of birth for 25 participants was Mexico. One was born in the United States to parents born in Mexico. The average educational attainment was 5 years of schooling for the female and 6 years for the male participants, with a range between 3 and 12 years (Poss, 1998).

The first item in the qualitative instrument was framed broadly as follows: "Please tell me what you know about tuberculosis?" Increasingly specific questions followed, focusing on information about the cause of tuberculosis as well as its symptoms, significance, treatment, and social meanings. The questions for the qualitative study were derived both from concepts from Kleinman's (1980) framework of EMs and from the combined HBM and TRA.

The consent form and qualitative research questions were written in English at a fourth-grade reading level. Both documents were then translated into Spanish, following standard translation and back-translation procedures to insure equivalency of the two versions. The English-to-Spanish translation was done by a bilingual Mexican American outreach worker at a community health center that serves migrant farmworkers. The Spanish version was independently translated back into English by a second bilingual Mexican American outreach worker.

The results of the translated English version were compared with the original English version and decentered according to procedures described by Brislin, Lonner, and Thorndike (1973); and Marín and Marín (1991). Decentering is a translation process in which both the source and the target language versions are considered equally important and subject to change during translation. The two versions of the instrument were very congruent, and no changes were necessary.

All interviews in the qualitative study were conducted in Spanish in the migrant camps, and were audiotaped, translated, and transcribed by the researcher, who is fluent in English and Spanish. Data analysis was performed using Glaser and Strauss's (1967) grounded theory method, which involves continuous and simultaneous data collection, coding, and analysis. Although the purpose of this study was not theory development, the investigator felt that the grounded theory approach would be the most effective method of analysis.

Data analysis involved using open coding, which is the breaking down, examining, comparing, conceptualizing, and categorizing of data (Strauss & Corbin, 1990). Categories that emerged from the open coding were compared with the categories from Kleinman's (1980) approach to discovering the components of EMs. The transcripts were analyzed for common themes, including tuberculosis etiology, symptoms, course, severity, treatment, and social significance. Interviews continued until all categories were well defined and saturated.

THE TII

Conventionally agreed on definitions of concepts from the HBM and TRA guided the development of the TII. Definitions of HBM concepts were based on a synthesis of definitions used by Janz and Becker (1984), Maiman and Becker (1974), and Rosenstock (1966, 1974a, 1990). Definitions of concepts from the TRA were based primarily on the work of Ajzen and Fishbein (1980). The researcher reviewed items developed by other investigators to operationalize the HBM and TRA concepts.

Questionnaire items were reviewed from studies based on the HBM (Barnhoorn & Adriaanse, 1992; D. Cabrera, personal communication, May 17, 1996; V. Ebin, personal communication, May 30, 1996; Schwab, Meyer, & Merrell, 1994; Wurtele, Roberts, & Leeper, 1982), the TRA (Marín, Marín, Perez-Stable, Otero-Sabogal, & Sabogal, 1990; Morrison, Gillmore, & Baker, 1995) and the combined HBM and TRA (VanLandingham, 1993).

The categories that emerged from the qualitative study were used to develop the closed-ended questions for the following six TII subscales based on the combined HBM and TRA model: (a) susceptibility, (b) severity, (c) behavioral beliefs, (d) attitude, (e) normative beliefs, and (f) subjective norm (see Figure 1). A question, rather than a statement, format was used to construct items because it was felt to be less confusing for subjects with an average educational level of fifth grade (Bernal, Wooley, & Schensul, 1997). For every subscale, more items were written than were anticipated to be necessary so that deletions could be made as instrument development proceeded.

Several examples of the transformation from qualitative data to quantitative interview item are provided to clarify the method used. When asked about the nature of tuberculosis, one farmworker said, "You can die from it [tuberculosis] if you don't get the right treatment. It's very serious." This statement formed the basis for the following question on the Severity subscale: "Can tuberculosis lead to death if not treated?"

In describing the symptoms of tuberculosis, one farmworker stated, "You lose weight and become very pale and tired. You can't work because you are too weak." This was used as the basis for the following question on the Severity subscale: "If you got tuberculosis, would it prevent you from working?" A number of respondents named measures that they believed could help to prevent tuberculosis (eating well, not smoking, and avoiding rapid temperature changes), and these formed the basis for the following question on the Susceptibility subscale: "Can you prevent getting tuberculosis?"

Farmworkers also identified benefits of and barriers to skin testing. Benefits of skin testing included knowing if they had tuberculosis, getting early treatment, and protecting their family; whereas barriers included pain, fear, and missing work. These statements were formed into questions for the

Behavioral Beliefs subscale, including "Can the tuberculosis test tell you if you have tuberculosis?" "Will having the tuberculosis test help to protect your family?" "Is having the tuberculosis test painful?" and "Will you have to miss work to have the tuberculosis test?"

The TII was reviewed for clarity, content, and appropriateness for use with migrant farmworkers by two experts in the field of migrant health care. The first was a nurse who has worked with migrant farmworkers for over 20 years. In addition to her own analysis, she engaged two bilingual, bicultural individuals who work with migrant farmworkers to review the instrument. The second was an anthropology professor at a western New York university who has conducted extensive research with migrant farmworkers in New York and California. Based on these reviews, the neutral response option was modified from "no opinion" to "not sure" because the Spanish equivalent was thought to be more easily understood by subjects.

The instrument was reviewed for content validity by Champion, an expert in instrumentation using the HBM (Champion, 1984, 1985; Champion & Huster, 1995). Based on her analysis, two items from the Susceptibility subscale and one from the Severity subscale were deleted.

Items in the TII subscales were measured on a 5-point Likert-type scale. The questions required responses as follows: *definitely yes*, *probably yes*, *not sure*, *probably no*, and *definitely no*. Respondents were asked first to respond to questions by indicating either "yes" or "no," and then they were asked to modify their yes or no response with "definitely" or "probably." The response format was adapted from Marín et al. (1990) in their study of Hispanic subjects' attitudes toward smoking.

The TII was developed in English and written at a fourth-grade reading level (Flesch-Kincaid grade level = 4.6). Translation and back-translation procedures were identical to those described in the development of the qualitative interview instrument. The Spanish and English versions of the instrument were very similar. A few minor modifications in wording were made with the assistance of the translators to increase the clarity of the Spanish version.

The final version of the TII contained 64 items, including 14 items designed to gather demographic data, and 3 items related to the cue-to-action and intention variables. The number of items in each subscale is indicated in Table 1, and the complete TII is shown in the appendices in both English and Spanish versions.

PILOT STUDY OF THE TII

After obtaining approval from the HSRC at the investigator's institution, the TII was pilot tested in April, 1997 on a sample of 20 migrant farmworkers. The purpose of the pilot test was to examine the clarity, content, ease of administration, and reliability of the instrument. The subjects for the

TABLE 1
Means, Standard Deviations, Range, and Reliabilities of TII Subscales ($n = 206$)

Subscale	Number of Items	M	SD	Range	α
Susceptibility	5	16.86	5.93	5 to 25	.90
Severity	8	33.31	6.25	12 to 40	.91
Behavioral beliefs	22	42.36	17.75	-42 to 74	.79
Attitude	4	17.58	2.67	5 to 20	.76
Normative beliefs	6	17.03	12.22	-14 to 30	.71
Subjective norm	2	8.25	2.12	2 to 10	.96

pilot study were chosen from those Mexican farmworkers who either spent the winter in western New York or who arrived early for the migrant season that normally begins in June.

After obtaining verbal informed consent, the researcher interviewed all subjects in Spanish in the migrant camps. Interviews took place in the evening, after the farmworkers returned from the fields. After each interview, subjects were questioned about any difficulties that they had with specific questions or the length of the interview. Farmworkers did not identify any items that were unclear or difficult to answer. They stated that the time required to complete the interview, an average of 30 minutes, was reasonable.

Following the pilot study, each subscale of the instrument was tested for internal consistency reliability using Cronbach's alpha. Based on interitem and item-to-subscale correlation coefficients, two items were deleted from the Severity subscale and one from the Barriers subscale, and the internal consistency coefficients were recomputed (Ferketich, 1991). When further deletions decreased the alpha coefficient, the scales were considered to be at maximum reliability (Carmine & Zeller, 1979).

THE QUANTITATIVE STUDY

In the summer of 1997, the main quantitative study was conducted, and all subjects were interviewed using the Spanish version of the TII. There were 206 subjects in this investigation, 164 (79.6%) males and 42 (20.4%) females, ranging in age from 18 to 67 years, with a mean age of 29 years. About one third of the respondents had less than a fourth-grade education, and another third had attended school for 4 to 6 years. Fifty-two farmworkers (25.2%) had a seventh- to ninth-grade education, and 28 (13.6%) had a 10th- to 12th-grade education. Study subjects had worked as migrant farmworkers between 1 and 40 years, with a mean of 7 years. The majority of subjects (80.1%) had worked between 1 and 10 years in agriculture. About one third of workers (33.5%) reported that they lived in Mexico during the winter months, whereas 56 (27.2%) lived in Texas, 45 (21.8%) lived in Florida, and 36 (17.5%) lived in New York state. The complete results of the quantitative study are reported elsewhere (Poss, in press).

Based on the responses of these subjects, the Cronbach's alpha scores were recalculated. Generally, alpha coefficients greater than .70 on a new scale are considered to be adequate (Ferketich, 1990). The mean scores, standard deviations, ranges, and internal consistency reliabilities of the TII subscales are shown in Table 1.¹

RECOMMENDATIONS FOR FUTURE RESEARCH

Further research is recommended to evaluate the stability of the TII among other groups of migrant farmworkers. In this study, the TII subscales had moderate to high Cronbach's alpha scores. Applying the TII to study farmworkers in other parts of the United States would allow additional testing of its reliability, using both test-retest and internal consistency reliability. In addition, the TII should be administered to a larger sample and then subjected to factor analysis to evaluate construct validity. If additional testing of the TII shows the instrument to be a reliable and valid tool, it could then be modified to study migrant farmworkers' attitudes about other illnesses that affect this group.

APPENDIX A

Tuberculosis Interview Instrument (English Version)

1. Have you ever had a skin test for tuberculosis?
 - (a) Yes
 - (b) No
2. If yes, what was the result?
 - (a) Positive
 - (b) Negative
3. What is your birth date? _____
4. Where were you born?
 - (a) Mexico
 - (b) United States
5. Where was your mother born?
 - (a) Mexico
 - (b) United States
6. Where was your father born?
 - (a) Mexico
 - (b) United States

7. Gender
 - (a) Male
 - (b) Female
8. Are you?
 - (a) Single
 - (b) Single, living with partner
 - (c) Married
 - (d) Divorced/separated
9. How many years have you been working as a migrant farmworker? _____
10. How many grades did you finish in school?
 - (a) Less than fourth grade
 - (b) Fourth to sixth grade
 - (c) Seventh to ninth grade
 - (d) 10th to 12th grade
11. Where do you generally live in the winter?
 - (a) Florida
 - (b) Texas
 - (c) Mexico
 - (d) Other (specify) _____
12. In general, how is your health?
 - (a) Excellent
 - (b) Good
 - (c) Fair
 - (d) Poor
 - (e) Very poor
13. How many cigarettes do you smoke in a day? _____
14. How many alcoholic drinks do you have in a week? _____

HBM—Perceived Susceptibility

15. Are you worried about getting tuberculosis?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
16. Does working as a migrant farmworker make you more likely to get tuberculosis than others?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
17. Are you scared of getting tuberculosis?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
18. Would it be easy for you to get tuberculosis?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no

19. Do you think you will get tuberculosis in the future?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no

HBM—Perceived Severity

20. If you got tuberculosis, would it be serious for you?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
21. Could tuberculosis do severe damage to your lungs?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
22. If you got tuberculosis, would it prevent you from working?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
23. If you got tuberculosis, would it have a bad effect on your family?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
24. If you got tuberculosis, would you suffer?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
25. If you got tuberculosis, might you die?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
26. If you got tuberculosis, would it cause pain in your lungs?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
27. If you got tuberculosis, would it be hard to breathe?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no

**HBM—Perceived Benefits Combined With TRA—
Behavioral Beliefs (even items = behavioral belief
about outcome; odd items = evaluation of outcome)**

28. Can the tuberculosis test tell you if you have tuberculosis?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
29. Is it good to find out if you have tuberculosis?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
30. If you find out you have tuberculosis, can you prevent spreading it to others?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
31. Is it good to prevent spreading tuberculosis to others?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
32. If the test shows you have tuberculosis, can you get early treatment?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
33. If you have tuberculosis, is it good to get early treatment?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
34. If you get early treatment for tuberculosis, will you be able to keep working?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
35. Is it good to be able to keep working?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
36. Will having the tuberculosis test help to protect your family?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no

37. Is it good to protect your family?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
38. If the test shows you have tuberculosis, can you be cured?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
39. If you have tuberculosis, is it good to be cured?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
40. Will having the tuberculosis test help you to protect your health?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
41. Is it good to protect your health?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no

**HBM—Perceived Barriers Combined With TRA—
Behavioral Beliefs (even items = behavioral belief
about outcome; odd items = evaluation of outcome)**

42. Is having the tuberculosis test painful?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
43. How do you feel about having a painful test?
 - (a) Very good
 - (b) Good
 - (c) Not sure
 - (d) Bad
 - (e) Very bad
44. Will you have to miss work to have the tuberculosis test?
 - (a) Definitely yes
 - (b) Probably yes
 - (c) Not sure
 - (d) Probably no
 - (e) Definitely no
45. How do you feel about missing work?
 - (a) Very good
 - (b) Good
 - (c) Not sure
 - (d) Bad
 - (e) Very bad

46. Will it take too much time to have the tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
47. How do you feel about using your time to have the tuberculosis test?
 (a) Very good
 (b) Good
 (c) Not sure
 (d) Bad
 (e) Very bad
48. Will it take too much time to return to have the tuberculosis test read?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
49. How do you feel about using your time to have the tuberculosis test read?
 (a) Very good
 (b) Good
 (c) Not sure
 (d) Bad
 (e) Very bad
50. Will having the tuberculosis test make you worry about tuberculosis?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
51. How do you feel about worrying about tuberculosis?
 (a) Very good
 (b) Good
 (c) Not sure
 (d) Bad
 (e) Very bad

HBM—Cue

52. Did you attend the program about tuberculosis tonight?
 (a) Yes
 (b) No

TRA—Intention

53. Do you intend to have a tuberculosis test tomorrow night here in this camp?
 (a) Definitely yes
 (b) Probably yes
 (c) Probably no
 (d) Definitely no
54. Do you intend to have your tuberculosis test read in 2 days here in this camp?
 (a) Definitely yes
 (b) Probably yes
 (c) Probably no
 (d) Definitely no

TRA—General Attitude

55. Is it a good idea to have a tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
56. Is it smart to have a tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
57. Is it difficult to have a tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
58. Is it helpful to have a tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no

TRA—General Subjective Norm

59. Do most people who are important to you think you should have the tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
60. Do most people whose opinion you respect think you should have the tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no

TRA—Normative Beliefs + Motivation to Comply (odd items = normative beliefs; even items = motivation to comply)

61. Do the people you work with think you should have the tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
62. Do you want to do what the people you work with think you should do?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no

63. Do your friends think you should have the tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
64. Do you want to do what your friends think you should do?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
65. Does your family think you should have the tuberculosis test?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
66. Do you want to do what your family thinks you should do?
 (a) Definitely yes
 (b) Probably yes
 (c) Not sure
 (d) Probably no
 (e) Definitely no
10. Hasta que año estudió en la escuela?
 (a) Menos del 4to grado
 (b) 4to - 6to grado
 (c) La secundaria 7o - 9o grado
 (e) La preparatoria 10o - 12o grado
11. Dónde vive generalmente durante el invierno?
 (a) Florida
 (b) Texas
 (c) Mexico
 (d) Otro (especifique por favor) _____
12. En lo general cómo está su salud?
 (a) Excelente
 (b) Buena
 (c) Más o menos
 (d) Mala
 (e) Muy mala
13. Cuántos cigarrillos fuma usted durante un día? _____
14. Cuántas bebidas alcohólicas toma usted durante una semana?
15. Está preocupado de que pueda contraer la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no

APPENDIX B

Tuberculosis Interview Instrument (Spanish Version)

1. Le han hecho alguna vez la prueba de la tuberculosis?
 (a) Sí
 (b) No
2. Cuál fue el resultado?
 (a) Positivo
 (b) Negativo
3. Cuál es su fecha de nacimiento? _____
4. Dónde nació usted?
 (a) Mexico
 (b) Los Estados Unidos
5. Dónde nació su madre?
 (a) Mexico
 (b) Los Estados Unidos
6. Dónde nació su padre?
 (a) Mexico
 (b) Los Estados Unidos
7. Sexo
 (a) Masculino
 (b) Femenino
8. Es usted:
 (a) Soltero
 (b) Soltero y vive en unión libre
 (c) Casado
 (d) Divorciado/separado
9. Cuántos años lleva como trabajador del campo? _____
16. Piensa que trabajando como obrero agrícola es más fácil contraer la tuberculosis en comparación con otros trabajos?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
17. Tiene miedo de contraer la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
18. Sería fácil para usted contraer la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
19. Piensa usted que puede contraer la tuberculosis en el futuro?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
20. Si usted contrae tuberculosis, sería algo serio para usted?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no

21. Puede la tuberculosis causar serios daños en sus pulmones?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
22. Si usted contrae la tuberculosis, le impediría de ir a trabajar?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
23. Si usted contrae la tuberculosis, tendría un mal efecto en su familia?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
24. Si contrae la tuberculosis, sufriría usted?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
25. Si usted contrae la tuberculosis, podría morir?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
26. Si usted contrae la tuberculosis, podría causar dolor en los pulmones?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
27. Si usted contra la tuberculosis, sería difícil la respiración?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
28. Cree usted que la prueba de la tuberculosis le dice a usted si tiene la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
29. Es bueno saber si usted tiene tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
30. Si usted sabe que tiene tuberculosis, puede prevenir contagiar a otros?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
31. Es bueno prevenir de contagiar a otros?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
32. Si la prueba dice que usted tiene tuberculosis, puede tener tratamiento temprano?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
33. Si usted tiene tuberculosis, es bueno tener tratamiento temprano?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
34. Si usted tiene tratamiento temprano para la tuberculosis, podría seguir trabajando?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
35. Es bueno poder seguir trabajando?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
36. Teniendo la prueba de la tuberculosis le ayudará a proteger a su familia?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
37. Es bueno proteger a su familia?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
38. Si la prueba dice que usted tiene la tuberculosis, puede usted ser curado?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no

39. Si usted tiene tuberculosis, es bueno ser curado?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
40. Teniendo la prueba de la tuberculosis ayuda a proteger su salud?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
41. Es bueno proteger su salud?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
42. Es doloroso la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
43. Cómo se siente acerca de tener una prueba dolorosa?
 (a) Muy bien
 (b) Bien
 (c) No estoy seguro(a)
 (d) Mal
 (e) Muy mal
44. Tendrá que faltar al trabajo para tener la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
45. Cómo se siente acerca de faltar al trabajo?
 (a) Muy bien
 (b) Bien
 (c) No estoy seguro(a)
 (d) Mal
 (e) Muy mal
46. Le tomará mucho tiempo tener la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
47. Cómo se siente usted acerca de tomar su tiempo para hacerse la prueba de la tuberculosis?
 (a) Muy bien
 (b) Bien
 (c) No estoy seguro(a)
 (d) Mal
 (e) Muy mal
48. Le tomará mucho tiempo para volver a que le lean la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
49. Cómo se siente acerca de tomar su tiempo para que le lean la prueba de la tuberculosis?
 (a) Muy bien
 (b) Bien
 (c) No estoy seguro(a)
 (d) Mal
 (e) Muy mal
50. Hacerse la prueba de la tuberculosis le hará preocuparse por la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
51. Cómo se siente acerca de preocuparse por la tuberculosis?
 (a) Muy bien
 (b) Bien
 (c) No estoy seguro(a)
 (d) Mal
 (e) Muy mal
52. Asistió al programa acerca de la tuberculosis?
 (a) Sí
 (b) No
53. Tiene la intención de hacerse la prueba de la tuberculosis mañana en la noche aquí en este campo?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) Probablemente no
 (d) Definitivamente no
54. Tiene la intención de volver en dos días para que le lean la prueba de la tuberculosis aquí en este campo?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) Probablemente no
 (d) Definitivamente no
55. Es buena idea hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
56. Es inteligente hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no

57. Es difícil hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
58. Le ayuda hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
59. Piensa que la mayoría de la gente que le importa piensa que usted debería hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
60. Piensa que la mayoría de la gente cuya opinión usted respeta piensa que usted debería hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
61. La gente que trabaja con usted piensa que usted debería hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
62. Quiere hacer lo que la gente que trabaja con usted piensa que usted debería hacer?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
63. Sus amigos piensan que usted debería hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
64. Quiere hacer lo que sus amigos piensan que usted debería hacer?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no
65. Su familia piensa que usted debería hacerse la prueba de la tuberculosis?
 (a) Definitivamente sí
 (b) Probablemente sí
 (c) No estoy seguro(a)
 (d) Probablemente no
 (e) Definitivamente no

66. Quiere hacer lo que su familia piensa que usted debería hacer?
 (a) Definitivamente sí
 (b) No estoy seguro(a)
 (c) Probablemente no
 (d) Definitivamente no

NOTE

1. The following discussion explains why negative scores were recorded on the Behavioral Beliefs and Normative Beliefs subscales. Items on these subscales were coded to allow the calculation of a multiplicative score, according to the method proposed by Ajzen and Fishbein (1980). For these subscales, questions related to beliefs were scored on a unipolar scale, ranging from 1 (*definitely no*) to 5 (*definitely yes*). Each belief question was followed by an evaluation question. The evaluation question was scored on a bipolar scale with anchors of +2 and -2. Each respondent's score on the belief question was multiplied by his or her score on the evaluation question. Next, the results for the entire subscale were summed to form a sum-of-products score (Lauver & Knapp, 1993). The formula for this calculation is $\sum b_i e_i$, where b is the belief about the outcome (i) and e is the evaluation of outcome (i). A cross product (Belief \times Evaluation) was formed for each of n possible outcomes, and then the products were summed (Fishbein & Middlestadt, 1989).

An example of the scoring from the Behavioral Beliefs subscale follows (Item 1 is the belief question and Item 2 is the evaluation question):

1. Can the tuberculosis test tell you if you have tuberculosis?
 (a) definitely yes (+5)
 (b) probably yes (+4)
 (c) not sure (+3)
 (d) probably no (+2)
 (e) definitely no (+1)
2. Is it good to find out if you have tuberculosis?
 (a) definitely yes (+2)
 (b) probably yes (+1)
 (c) not sure (0)
 (d) probably no (-1)
 (e) definitely no (-2)

If a subject responded "probably yes" to Item 1 and "definitely yes" to Item 2, the score for this dyad of questions would be +8 because $+4 \times +2 = +8$. If the response was "definitely no" for Item 1 and "probably no" for Item 2, the score would be -1 because $+1 \times -1 = -1$. Possible scores for each set of items range from +10 to -10.

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Jane E. Poss, DNSc, ANP, is the director of the Family Nurse Practitioner Program in the Department of Nursing at the University of Texas at El Paso. She received her DNSc from the State University of New York at Buffalo. Her research and clinical interests include migrant farmworkers, tuberculosis, diabetes, and the provision of health care to underserved populations.