# Transcultural Adaptation and Validation of the Korean Version of the Brief Illness Perception Questionnaire for Patients with Pulmonary Tuberculosis

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## Abstract

**Background and Aim:** The brief illness perception questionnaire (BIPQ) has been used in many populations for both adults and children, and it provides a rapid assessment of illness perception. This study was performed to create a translated version of the BIPQ to fit the Korean society and to test its validity through pulmonary tuberculosis (TB) patients. **Methods:** Translation and transcultural adaptation of BIPQ, applicable to the Korean society, was performed in accordance with the international guidelines. Internal consistency, test-retest reliability, concurrent validity, and discrimination validity were evaluated. To assess the discrimination validity, the BIPQ scores were compared between pulmonary TB and chronic obstructive pulmonary disease (COPD). **Results:** Sixty-eight patients with pulmonary TB participated in this study. Cronbach's $\alpha$ coefficient was 0.753, which indicated satisfactory internal consistency. The concurrent validity showed significant correlations (Pearson's correlation of 0.753). The test-retest reliability was confirmed with an intraclass correlation coefficient of 0.892. The total score of BIPQ in patients with COPD was significantly higher than that in those with pulmonary TB (37.67 vs. 30.85; $P = 0.005$), which supported the discrimination validity. **Conclusions:** The Korean version of BIPQ was found to be a reliable and valid questionnaire for patients with pulmonary TB.

**Keywords:** Consistency, illness perceptions, reliability, tuberculosis, validity

## INTRODUCTION

The coping mechanisms by patients after developing an illness may vary widely as they create their own perceptions or representations of their illness. Many physicians are usually ignorant to these self-manifested illness perceptions by individual patients. Illness perceptions are defined as organized cognitive representations or beliefs that patients have about their illness.[1] It is important to acknowledge that this illness perception has been associated with numerous outcomes, such as treatment adherence and functional recovery.

A semistructured interview using open-ended questions has been used initially to investigate the illness perceptions of patients. However, due to several drawbacks of this technique, the development of illness perception questionnaire (IPQ) soon followed,[2] providing a straightforward assessment of major components of illness perceptions. In addition, to be more suitable for those who are very ill or are older, the IPQ was shortened and renamed as the brief IPQ (BIPQ),[3] making

it easier to investigate illness perception in a wider range of patient groups.

Tuberculosis (TB) is a major cause of mortality and morbidity worldwide. For a successful treatment outcome, including controlling the spread of infection and minimizing the development of drug resistance, adherence to TB treatment is essential.[4] Illness perception of TB helps determine the health-seeking behavior of patients, which further influences treatment adherence. Previously, only two studies have

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evaluated the illness perception for patients with TB using the BIPQ.[5,6] In South Korea, TB incidence remains the highest among high-income countries, and the rate of decrease in the TB incidence seems to have slowed over the past 15 years. Issues on patient management including adherence to TB treatment were recently highlighted to overcome the challenges of TB control.

The objective of this study was to translate the BIPQ into the Korean language and adapt it to be applicable for Korean patients with pulmonary TB, and test the psychometric properties of the BIPQ in terms of concurrent validity, internal consistency, and test-retest reliability.

## METHODS

This study was divided into two parts: (1) translation and transcultural adaptation of English version of the BIPQ into Korean and (2) to test the psychometric properties of the Korean version of the BIPQ.

Translation and transcultural adaptation were conducted in accordance with the standardized international recommendation.[7] Permission was obtained from the developer of the BIPQ to translate it into Korean. Two native Korean speakers fluent in English (one physician and one nonmedical translator) independently translated the questionnaire. A single Korean version of the BIPQ was obtained by reconciling the two translated versions at a consensus meeting. The reconciled Korean version was then back-translated into English by two bilingual native English speakers (again, one health-care professional and nonmedical personnel), who were blinded to the original English version. The back-translated and original versions of the BIPQ were reviewed and revised to establish the prefinal Korean version of the BIPQ. The final Korean version of the BIPQ was completed after an in-depth review and modification of the prefinal version. Patients with pulmonary TB were included to validate the Korean version of the BIPQ.

The study was conducted from June 1 to November 30, 2015 at Chungbuk National University Hospital, South Korea. Annually, about 180 TB patients are diagnosed and treated in our hospital. The sample size was calculated based on population size of 90 during the study period with 5% margin of error at a 90% confidence level. We estimated the sample size of 68. The internal consistency, which is the degree of homogeneity of the items in the BIPQ, was assessed through Cronbach's α coefficient. Cronbach's α coefficient ≥0.70 was regarded as satisfactory. The test-retest reliability, which denotes stability across the repeated measurement, was evaluated through intraclass correlation coefficient (ICC) with 95% confidence interval. An ICC >0.70 was regarded as indicative of good reliability. To measure the concurrent validity, which suggests that the value of one parameter would have a quantitative relationship with another similar value of a different parameter, the correlation between the results of the BIPQ and TB score[8] was tested using the Pearson's correlation

coefficient. TB score is a clinical score to assess the risk of mortality and treatment failure for TB patients. Pearson's correlation coefficient >0.50, 0.30–0.50, and 0.10–0.30 was considered as large, medium, and small, respectively, with respect to strength of association. To assess the extent to which the BIPQ could distinguish between different illnesses, we evaluated the discrimination validity. Patients with chronic pulmonary obstructive disease (COPD) were recruited, and we compared the mean scores of the BIPQ between patients with pulmonary TB and COPD using independent *t*-test. All statistical analyses were performed using SPSS version 15.0 (SPSS, Chicago, IL, USA), and *P* < 0.05 was considered statistically significant.

## RESULTS

Sixty-eight patients with pulmonary TB participated in the concurrent validity study. The mean age of patients was 53.9 years, and there were 48 males and 20 females.

Cronbach's α coefficient was 0.753, which indicated no heterogeneity. All domains had satisfactory internal consistency, showing a Cronbach's α coefficient of above 0.700 [Table 1]. The emotional representation had the highest Cronbach's α coefficient.

The concurrent validity showed that there were significant correlations (Pearson's correlation of 0.753) for all the domains, except for coherence [Table 2]. Consequence, timeline, identity, illness concern, and emotional representation were positively correlated with TB score while personal control and treatment control were negatively correlated with TB score.

The test-retest reliability of the BIPQ was assessed in 23 patients. The follow-up questionnaire was completed after 2–4 weeks. The test-retest reliability was confirmed with an ICC of 0.892 [Table 3]. The identity subscale showed the highest ICC (0.864) while the personal control subscale showed the lowest (0.729).

To assess the discrimination validity, the BIPQ scores were compared between pulmonary TB and COPD [Table 4]. The total score of BIPQ in patients with COPD was significantly higher than that of pulmonary TB (37.67 vs. 30.85; *P* = 0.005). Among the eight domains of BIPQ, timeline, personal control,

**Table 1: Internal Consistency of Eight Domains of Brief Illness Perception Questionnaire**

| BIPQ domains | Cronbach's α coefficient |
|---|---|
| Consequences | 0.703 |
| Timeline | 0.708 |
| Personal control | 0.716 |
| Treatment control | 0.702 |
| Identity | 0.703 |
| Illness concern | 0.734 |
| Coherence | 0.736 |
| Emotional representation | 0.793 |

BIPQ: Brief illness perception questionnaire

**Table 2: Pearson Correlations of Brief Illness Perception Questionnaire With Tuberculosis Score in Patients With Pulmonary Tuberculosis**

| BIPQ domains | TB score |
|---|---|
| Consequences | 0.535 |
| Timeline | 0.451 |
| Personal control | −0.420 |
| Treatment control | −0.448 |
| Identity | 0.636 |
| Illness concern | 0.489 |
| Coherence | −0.085 |
| Emotional representation | 0.552 |

TB: Tuberculosis, BIPQ: Brief illness perception questionnaire

**Table 3: Test-Retest Reliability of Brief Illness Perception Questionnaire**

| BIPQ domains | Intraclass correlation coefficient |
|---|---|
| Consequences | 0.758 |
| Timeline | 0.832 |
| Personal control | 0.729 |
| Treatment control | 0.779 |
| Identity | 0.864 |
| Illness concern | 0.758 |
| Coherence | 0.784 |
| Emotional representation | 0.761 |

BIPQ: Brief illness perception questionnaire

**Table 4: Mean Scores of Brief Illness Perception Questionnaire in Pulmonary Tuberculosis and Chronic Obstructive Pulmonary Disease**

| BIPQ domains | Pulmonary TB | COPD | *P* |
|---|---|---|---|
| Consequences | 4.75 (3.43) | 4.41 (3.29) | 0.342 |
| Timeline | 4.15 (3.30) | 5.90 (3.05) | 0.002 |
| Personal control | 6.89 (2.76) | 5.33 (2.56) | 0.002 |
| Treatment control | 7.94 (2.37) | 6.47 (2.81) | 0.002 |
| Identity | 3.61 (3.14) | 5.16 (2.93) | 0.006 |
| Illness concern | 5.21 (3.39) | 5.90 (3.51) | 0.273 |
| Coherence | 6.13 (2.80) | 5.78 (3.00) | 0.504 |
| Emotional representation | 4.08 (3.20) | 3.88 (3.30) | 0.738 |
| Total score of BIPQ | 30.85 (14.53) | 37.67 (10.97) | 0.005 |

COPD: Chronic obstructive pulmonary disease, BIPQ: Brief illness perception questionnaire, TB: Tuberculosis

treatment control, and identity were significantly different. The personal and treatment controls were higher in patients with pulmonary TB while timeline and identity were higher in patients with COPD.

According to the answers to the open-ended question regarding patients' opinion on the main causes of illness, stress, smoking, and unhealthy behavior ranked among the top. Approximately 14.7% of patients left this open-ended question blank or stated that they do not know the causes. Only 7.4% of participants stated that germs or contact with TB patient as the main cause of disease.

## Discussion

This study shows that the Korean version of BIPQ is a reliable, internally consistent, and valid instrument. The internal consistency and test-retest reliability were satisfactory for all subscales. Therefore, this questionnaire can be used reliably in clinical and research settings to evaluate the illness perception among Korean patients.

Despite its massive economic development, recent data indicate that South Korea stands out in terms of TB burden among high-income countries. Many factors were pointed out for its high incidence;[1] high prevalence of latent TB infection in the elderly population,[2] an increasing population with diabetes,[3] high smoking rate, and[4] immigrants from high-burden countries. In addition, lacks of monitoring and patient management during standard TB treatment have been potential barriers to the advancement of TB control. Until recently, South Korea had no mandate for isolating smear-positive TB patients, even those who were noncompliant or who had multidrug-resistant disease. The use of a reliable tool, such as the BIPQ, in routine clinical practice can easily assess the illness perception and detect problems in patients' behavior that disturbs adherence to treatment and leads to default or treatment failure.

The BIPQ has been used widely in all age groups, including children, in various illness types, and in multiple countries and languages. To date, it has been translated into four different languages: Dutch,[9] Iranian,[10] Spanish,[11] and Taiwanese.[12] Although this questionnaire was mostly used in patients with chronic illness, such as cancer, ischemic heart disease, and diabetes, two studies[5,6] have recently evaluated the illness perception of patients with TB using the BIPQ. The illness perceptions of TB, which can be conveniently assessed by the BIPQ, are important determinants of behavior and have also been associated with treatment adherence. Incomplete adherence to treatment has been identified as one of the most serious problems in the management of TB. South Korea is a country with an intermediate burden of TB,[13] and this questionnaire may play a pivotal role in improving the treatment success rate. Moreover, BIPQ offers brevity and reduced participation burden, which are two important features in a busy clinical setting with the need for repeated follow-up assessment.

TB score was used for concurrent validity. It is a simple clinical score that is developed for clinical evaluation of TB patients during treatment.[14] TB score components include self-reported symptoms (cough, dyspnea, night sweats, hemoptysis, and chest pain) and signs (anemia, tachycardia, positive finding at lung auscultation, axillary temperature, body mass index, mid-upper arm circumference). In this study, the overall BIPQ score was concordant with TB score. Patients with higher TB score have a greater number of signs and symptoms indicating a more threatening perspective of the disease. Thus, it is justifiable that subscales of emotional representation and illness concern, among others, were positively correlated with TB score.

The discrimination validity was tested to distinguish between the two different respiratory diseases: pulmonary TB and COPD. The differences were in line with our expectations. The total score of BIPQ in patients with pulmonary TB was lower than that in those with COPD, which is correlated with the previous study.[5] Patients with COPD had perceptions that reflected a much longer timeline of the disease course. Conversely, those with pulmonary TB had greater beliefs in both personal control and treatment control.

Regarding the open-ended question on the main cause of pulmonary TB, more than 10% of participants were unable to specify the main cause of pulmonary TB. The answers were categorized according to the perceived causes of illness from the revised IPQ. The top three rated causes in this study were similar to those from the European group (stress, smoking, and malnutrition),[5] but different from the Sudanese study (poor nutrition, poverty, and contact with TB patients).[6]

The study has a couple of limitations. First, the sample size is small; however, considering a small number of population size and a target population with a single disease entity, it is acceptable to make reasonable inferences. In addition, the BIPQ is widely used in various illness types and many languages. Secondly, since only patients with pulmonary TB were enrolled in this study, further evaluation of its applicability in other disease entities or age groups may be necessary.

## CONCLUSIONS

The BIPQ was translated and adapted transculturally, in accordance with the international guidelines, to fit the Korean society. Implementation of the BIPQ in the routine practice would allow better understanding of patients' behavior, which assists further effective management of TB patients.

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### Conflicts of interest

There are no conflicts of interest.

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