Original Research

Validation of an Arabic version of an instrument to measure waterpipe smoking behavior

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ABSTRACT

Objectives: Reliable and valid measures of waterpipe smoking are essential to study its health effects. The purpose of this study was to examine the reliability and validity of an Arabic translation of Maziak questionnaire that assesses various aspects of waterpipe smoking in epidemiological studies.

Study design: A cross-sectional study.

Methods: This questionnaire was translated, back translated, and culturally adapted to the local Arabic dialect. Construct and convergent validity were assessed in a sample of 119 daily waterpipe smokers (WPS) and 30 occasional WPS, defined as smoking at least one waterpipe per week but less than daily from Beirut and Doha (mean age = 52.4 years, males = 61.7%). Construct validity was assessed by comparing the smoking behavior of daily and occasional WPS. Convergent validity was assessed by correlating daily smoking intensity ('number of waterpipe smoked per day') with 'number of waterpipe smoked yesterday' and by correlating lifetime smoking exposure (waterpipe-year) calculated by multiplying number of waterpipe smoked per day × duration of waterpipe smoking with alternate measures obtained graphically (graphical waterpipe-year) or adjusted (adjusted waterpipe-year). Criterion validity was assessed by correlating daily smoking intensity and lifetime smoking exposure with serum cotinine level. Test–retest reliability was analyzed by re-administering the questionnaire to 30 daily and 30 occasional WPS after 2 weeks.

Results: Smoking intensity, patterns of use, and willingness to quit differed significantly between daily and occasional WPS. Daily smoking intensity correlated strongly with the number of waterpipe smoked yesterday ($r_s = 0.68$, $P < 0.001$), but not in the occasional WPS ($r_s = 0.13$, $P = 0.70$). Waterpipe-year correlated very strongly with adjusted waterpipe-year and graphical waterpipe-year ($r_s = 0.98$, $P < 0.001$ and $r_s = 0.92$, $P < 0.001$, respectively). Waterpipe-year, daily smoking intensity, and number of waterpipe smoked yesterday,

correlated weakly but significantly with serum cotinine levels (r_s = 0.243, P = 0.01; r_s = 0.359, P < 0.01 and r_s = 0.387, P < 0.01, respectively). The type and pattern of waterpipe use items showed high test-retest reliability with near perfect agreement (k > 0.9), the sharing and intention to quit waterpipe items had substantial agreement (k > 0.6), and the intent to quit item showed moderate agreement (k > 0.4).

Conclusion: The questionnaire showed strong reliability, face validity, construct and convergent validity, and a weak but statistically significant criterion validity. Maziak questionnaire is valid and reliable for assessing waterpipe smoking patterns, intensity, and willingness to quit.

Introduction

Waterpipe tobacco smoking is thought to originate in Southeast Asia, North Africa, and India.[1,2] In the early 1990s, when flavored tobacco was introduced, waterpipe smoking grew in popularity and became the most common method of tobacco use among Arab youth aged between 13 and 15 years.[3–5] Waterpipe smoking also appeared to be spreading among new populations such as college students in the United States and in European countries.[1,6–9]

Facing this global waterpipe smoking epidemic, several researchers studied different aspects of waterpipe smoking and its potential harmful health effects. Multiple instruments for measuring the use of and dependence on waterpipe smoking were used.[10–14] Although these instruments allow better evaluation of the waterpipe smoking epidemic, a recent meta-analysis concluded that they lack validation.[10] These instruments may therefore introduce a potential bias and decrease the confidence in the estimates of waterpipe smoking prevalence and its adverse health effects.[10]

One of these instruments developed by Maziak et al. (2005), is a 10-item questionnaire that assesses different aspects of waterpipe smoking including smoking intensity, patterns of use, and willingness to quit.[13] This questionnaire was generated using literature review along with tobacco research experts' opinion. To our knowledge, the reliability and validity of this instrument was not assessed (personal communication with Dr. Maziak). The purpose of this study is to assess the reliability and validity of an Arabic translation of the Maziak questionnaire.

Methods

Sample and procedure

The study sample includes 149 participants from two Arab countries, Lebanon and Qatar. One hundred and fifteen participants were recruited from the community in Beirut, Lebanon, including 95 daily waterpipe smokers (WPS) and 20 occasional WPS, whereas 34 participants were recruited from the community in Doha, Qatar, including 24 daily WPS and 10 occasional WPS. Participants were approached directly while smoking waterpipes in cafes and through advertisements in

newspapers and on social media. All participants signed an informed consent. The study was approved by the American University of Beirut Institutional Review Board (IM.HC.03) and Hamad Medical Center Institutional Review Board (13-00054).

An Arabic translation of the waterpipe smoking questionnaire was administered in a face-to-face interview to all the participants by study personnel. Cotinine levels for the daily WPS were measured using the cotinine direct ELISA kit (Bio-Quantin Kits) on fasting morning serum samples after 6 h of abstinence from smoking and values were reported in nanograms per milliliter.

To evaluate the test–retest reliability, the questionnaire was re-administered 2 weeks later to 60 participants, including the first 30 enrolled daily WPS and the 30 occasional WPS.[15] Forty of those participants were from Beirut (20 daily and 20 occasional WPS) and 20 from Doha (10 daily and 10 occasional WPS).

Generalizability

The questionnaire was translated into Arabic and back translated to English by experienced translators to increase the quality and accuracy of the translation. Due to diversity in the local terms used in describing waterpipe smoking in Lebanon and Qatar, alternate words were used in the Arabic version (arguileh vs sheesha; ras vs nafas; ajami vs tambak vs gidou vs salloum) to enhance the linguistic clarity of the Arabic version of the questionnaire. An additional item about the type of waterpipe tobacco used (maasal or ajami/tambak/gidou/salloum) was added to the questionnaire to assess for generalization of the questionnaire to different types of waterpipe tobacco smoked.

Test–retest reliability

Sixty participants, 30 daily and 30 occasional WPS, from Lebanon and Qatar were interviewed twice, at least 2 weeks apart. Test–retest reliability was evaluated to investigate consistency of the questionnaire items by comparing the answers of each participant on the first and second interview.

Face validity

The waterpipe smoking questionnaire was adopted from an English version by Maziak et al.[13] The English version was