



Research Paper

The Psychometric Properties of the Persian Version of the Smoking Urge Questionnaire in the General Population



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ABSTRACT

Background: The urgent need and craving for smoking are significant aspects of smoking cessation syndrome, often leading to high relapse rates. Therefore, evaluating smokers' cravings and immediate needs is essential, and the questionnaire on smoking urges (QSU) is a remarkable instrument for this purpose.

Objectives: This study aimed to evaluate the reliability and validity of the Persian version of QSU among the general population.

Materials & Methods: This is a descriptive cross-sectional study. The studied population includes 200 smokers from the general population referred to Shafa Hospital, Rasht City, Iran, in 2023. The QSU was translated and reviewed by translators and bilingual experts to achieve the final Persian version. We assessed the content validity, reliability, and factor analysis of QSU. The IBM SPSS software, version 26 was used for data analysis. In addition, confirmatory factor analysis was performed using Smart PLS software, version 3.2.9.

Results: The results showed that the content validity rate was 0.94. The QSU exhibited a Cronbach α of 0.892, indicating high internal stability of the scale. After presenting the confirmatory factor model, 2 questions from the first factor and 4 questions from the second factor were removed due to their factor loadings of <0.3 . The factor loadings of the items of the QSU in the first subscale were between 0.353 and 0.787 and in the second subscale were between 0.248 and 0.706.

Conclusion: This study showed that QSU is reliable for measuring the "urgent need to smoke" in the Persian-speaking community.

Keywords: Psychometrics, Craving, Smoking cessation, Smokers

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Highlights

- Assessing the psychometric properties of the questionnaire on smoking urges (QSU) is mandatory.
- This study confirmed the content validity rate and content validity index (CVI) in terms of simplicity, relevance and transparency.
- The questionnaire on smoking urges is a reliable tool for measuring the urgent need to smoke in the Persian-speaking community.

Introduction

Smoking substantially increases the likelihood of drug use, highlighting the challenge of overcoming the urgent need and strong desire to smoke as obstacles to quitting [1]. Nicotine functions as the primary cause of tobacco addiction, persuading individuals to smoke despite known health risks by triggering cravings and compulsive behaviors [2]. Its addictive properties originate from its ability to boost dopamine levels, altering neural sensitivity and affecting attention, stress response, and self-regulation [3]. Withdrawal symptoms emerge upon cessation of smoking due to enduring changes in brain function resulting from prolonged nicotine exposure [4].

Understanding nicotine addiction as a “disease of compulsion and motivation” underscores the difficulties in quitting and emphasizes effective treatment strategies that address withdrawal symptoms and predict relapse risks. Current smoking cessation methods primarily target individuals already motivated to quit, leaving a significant portion of smokers without adequate support. Given that smoking contributes to half of premature deaths among chronic users, addressing tobacco dependence becomes imperative for reducing illness and mortality rates [5].

Despite the prevalence of smoking and its adverse effects in Iran, a shortage of evidence exists on the comprehensive evaluations of smoking urges and craving severity using tools like the questionnaire on smoking urges (QSU) [5]. This questionnaire presents a promising path for assessing smokers’ mindsets through self-reporting, identifying factors spreading consumption, and guiding health planning efforts to control tobacco use [6]. Improving the psychometric properties of such assessment tools within the general population can update treatment approaches and interventions to reduce tobacco consumption [5]. In light of these considerations, we aimed to examine the psychometric properties of the Persian version of the QSU in the general population.

Materials and Methods

This descriptive cross-sectional study recruited voluntary smokers from the general population referred to [Shafa Hospital](#) in Rasht City, Iran, in 2023. The inclusion criteria comprised individuals expressing a desire to participate, engaging in daily smoking, meeting the diagnosis of smoking disorder according to the diagnostic and statistical manual of mental disorders, fifth edition (DSM-5) criteria, and being categorized as moderate to heavy smokers based on Fagerström’s criteria [7]. The exclusion criteria involved unwillingness to participate in research, the presence of serious psychiatric disorders (such as schizophrenia or bipolar disorder), cognitive impairments (including dementia or delirium), and mental disabilities.

Feedback from 20 patients was sought for face validity, while content validity was assessed by a panel of 10 psychiatrists and psychologists specializing in the field. Construct validity was evaluated using a sample of 200 individuals, with at least 6 participants per question.

This study evaluated the reliability using the Cronbach α and test re-test method. To ascertain internal consistency and external reliability, data from 20 patients were utilized over two stages with a 15-day interval. The convergent validity was examined using the tobacco craving questionnaire (TCQ) in 40 patients.

The QSU was translated after obtaining permission from its creator. The translated questionnaire was reviewed by two translators and a panel of bilingual experts to ensure accuracy and loyalty to the original version, resulting in the final Persian version. There were no age or sex restrictions for participation.

The study population comprised smoking volunteers from the general population who engaged in daily smoking and met the criteria for “tobacco use disorder” as per DSM-5 criteria. Fagerström questionnaire was adminis-

tered upon obtaining informed consent to assess smoking intensity, excluding light users and including moderate to heavy users. After completing a demographic questionnaire, the QSU questionnaire was administered following a 2-hour deprivation period, with questions explained face-to-face and recorded in writing.

The QSU questionnaire evaluated four domains: Desire to smoke, anticipation of immediate positive outcomes from smoking cessation, positive predictions regarding relief from nicotine deprivation and intention to smoke. The questionnaire was scored on a scale from 1 to 7, yielding a total score between 32 and 224. The validity and reliability of its shorter versions have been confirmed internationally, aiding in understanding smokers' cravings and intentions [4, 8].

Study tools

Tobacco craving questionnaire (TCQ)

The TCQ new multidimensional questionnaire is a valid and reliable 47-item self-report tool that evaluates the craving for tobacco use in four dimensions: Emotionality, expectancy, compulsivity, and purposefulness. The validity and reliability of its short form have been examined and confirmed in the Iranian population. Each subject is based on the rating criteria from 1 (completely disagree) to 7 (completely agree). The questions are scored, and the sum of these scores is the total score of smoking craving [9, 10].

The Fagerström test for nicotine dependence (FTND)

FTND is a standard tool for assessing the severity of physical addiction to nicotine. This test is designed to provide a measure of nicotine dependence related to smoking, the validity and reliability of which have been investigated and confirmed by Soleimani et al. [11] in the Iranian population. This tool includes six items. The first item is the time of the first cigarette in the morning, the second is the person's inability to comply with the prohibition of smoking, the third is the inability to eliminate each cigarette, the fourth is the number of cigarettes per day, the fifth is the number of cigarettes when waking up, and the sixth is smoking during illness and hospitalization. In scoring the FTDN, yes/no items are scored from 0 to 3. Items are summed to obtain a total score of 0 to 10. The higher the total Fagerstrom score, the more severe the patient's physical dependence on nicotine. A score of 0-2 is very mild, a score of 3-4 is mild, a score of 5 is moderate, a score of 6-7 is severe, and a score of 8-10 is considered very severe [11, 12].

Data analysis

The IBM SPSS software, version 26 was used for data analysis. Confirmatory factor analysis was performed using Smart PLS software, version 3.2.9.

A fundamental criterion for assessing the model's fit is examining the coefficients of determination associated with the model. It is important to note that R^2 values are displayed within the circles of the model. R^2 values of 0.19, 0.33 and 0.67 are indicators of weak, moderate, and strong fit criteria, respectively. Another criterion for evaluating the model's predictive capability is the Stone-Geisser criterion (Q^2). Models with acceptable structural fit should be capable of predicting indicators related to structures. Regarding the predictive power severity of the model, values of 0.02, 0.15 and 0.35 represent weak, moderate, and strong predictive power, respectively.

Results

Our results on 200 participants indicated that the majority (78%) of them were under the age of 50 years. Approximately 52.5% were married, and 48.5% were employed. The mean duration of smoking among participants was 11.7 ± 7.9 years, with durations ranging from 1 to 40 years. Furthermore, the majority (60.5%) had been smoking for 10 years or more. Table 1 presents the characteristics of participants.

In addition, the content validity ratio (CVR) was 0.94, which was acceptable. The content validity index (CVI) in terms of simplicity was 0.95, relevance was 0.95 and clarity was 0.89, which were all above 0.8 and acceptable.

The CVR of all questionnaire items was also calculated; all were 0.78 or higher, which was acceptable.

To investigate and validate the 32-item version of the QSU, each item is rated on a Likert scale from 1 to 7, ranging from "strongly disagree" to "strongly agree." Questions 6, 8, 10, 11, 16, 17, 21, 22, 26, 27, 28 and 32 utilize reverse scoring. The total score on the questionnaire falls within the range of 32 to 224, with higher scores indicating a greater sense of urgency to smoke. According to the findings, the average scores of items 26, 30 and 21 were the lowest, and items 5, 20, 12 and 14 had a higher average.

Questions 29 and 30 from the first factor and 11, 21, 23 and 32 from the second factor were removed from the model due to factor loadings <0.3 . Subsequently, a re-

Table 1. The baseline characteristics of participants

Variables	No. (%) / Mean $\pm$ SD
Age (y)	<30
	41(20.5)
	30-40
	60(30)
	40-50
	55(27.5)
Age (y)	>50
	44(22)
	Mean $\pm$ SD
	39.30 $\pm$ 12.53
	(Max, Min)
	(15, 72)
Sex	Female
	61(30.5)
Sex	Man
	139(69.5)
Residence	Urban
	162(81)
Residence	Rural
	38(19)
Education	High school
	79(39.5)
	Diploma
Education	63(31.5)
	University
Education	58(29)
	Single
	95(47.5)
Marital status	Married
	105(52.5)
Employment	Others
	97(48.5)
	Employee
Employment	58(29)
	Unemployed
Employment	45(22.5)
	<10
	79(39.5)
Duration of smoking (y)	>10
	121(60.5)
	Mean $\pm$ SD
	11.67 $\pm$ 7.89

vised confirmatory factor model was constructed based on the collected data. The factor loadings of items in the QSU first subscale ranged from 0.353 to 0.787, with the highest loading observed for question 7 and the lowest for question 18. In the second subscale, factor loadings ranged from 0.248 to 0.706, with question 20 exhibiting the highest loading and question 6 the lowest (Figure 1).

The t-values for each item were outside the range of 1.96 to -1.96. A statistical relationship exists between the items within each subscale and the respective subscale itself. Hence, based on this analysis, none of the items are considered necessary for deletion. Based on the calculated R^2 values, the adequacy of the model's fit is affirmed.

In the case of the first subscale, the Q^2 value equals 0.392, indicating strong predictive power. For the second subscale and the urgent need to smoke, Q^2 values are calculated as 0.197 and 0.291, respectively, signifying the moderate predictive power of the model.

The findings demonstrated a direct and significant correlation between the QSU and its first subscale with the TCQ, indicating convergent validity between these two assessments.

Regarding internal reliability, Cronbach α was calculated to assess the scale's internal consistency. The QSU exhibited a Cronbach α of 0.892, indicating high internal stability of the scale. The Cronbach α values for the two

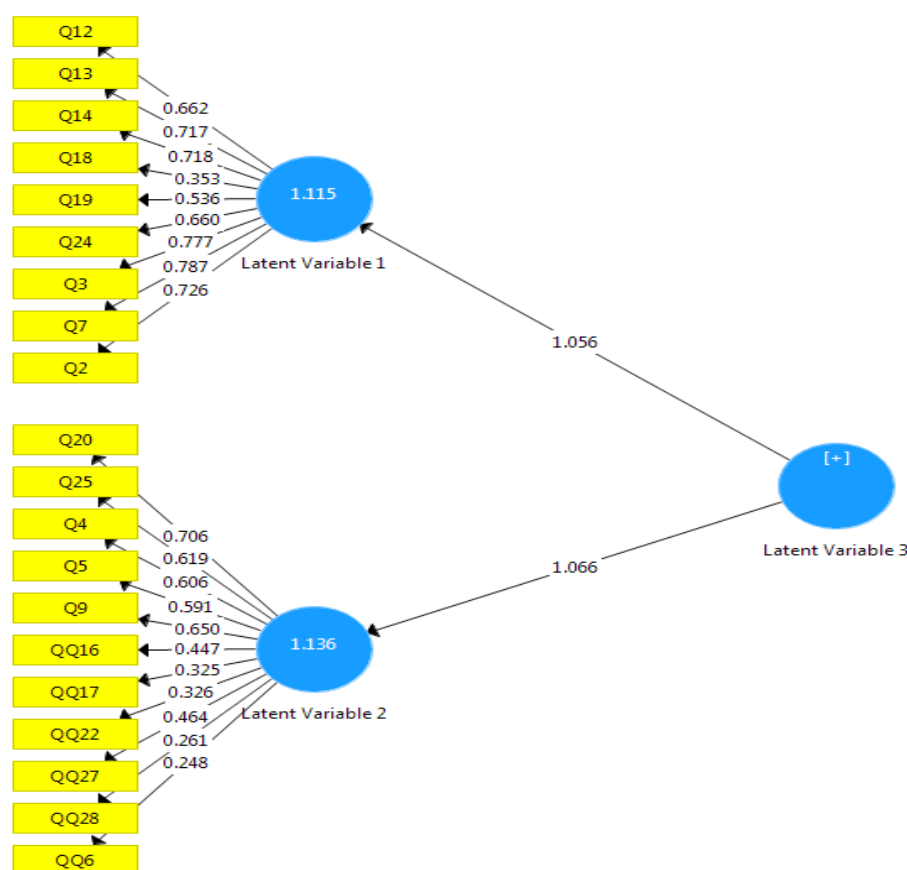


Figure 1. Factor loadings of the items of the QSU in the model with two subscales

subscales were also 0.874 and 0.766, respectively. In addition to the traditional criterion of Cronbach α , composite reliability was utilized to determine the internal reliability of each structure. A composite reliability value exceeding 0.7 for each structure indicates appropriate internal stability for the measurement model, while a value below 0.6 suggests a lack of reliability. Notably, the combined reliability values for the model structures surpassed 0.7, further affirming their internal stability.

The correlation coefficient between the scores obtained from the repeated execution of the test in each of the subscales and the total score has a high value, indicating the tool's good reliability.

Discussion

This study aimed to assess the psychometric properties of the Persian version of the QSU among the general population. The investigation focused on the complete 32-item version of the questionnaire. The study confirmed the CVR-scale and CVI-scale in terms of simplicity, relevance, and transparency. Notably, 60.5% of

participants reported smoking for ten years or more. A significant correlation was observed between the QSU and its first subscale with the TCQ, indicating convergent validity. The QSU exhibited high internal consistency, with a Cronbach α of 0.892. Several items underwent revisions and recalculations to improve validity. Factor loadings for the QSU ranged from 0.353 to 0.787 in the first subscale and from 0.248 to 0.706 in the second subscale. The model's predictive power, measured by Q^2 , indicated strong predictive power for the first subscale and average predictive power for the second subscale and the overall QSU. The combined reliability values for model structures exceeded 0.7. Additionally, the correlation coefficient between test scores obtained from repeated administrations demonstrated good reliability.

The study's findings align with previous research [13], reflecting strong internal consistency and measurement capability of the QSU. The tool exhibited adequate validity and diagnostic power for assessing the "urgent need to smoke" in the community. While studies on the psychometrics of the complete and brief QSU exist in other languages, there has not been a study on the psy-

chometrics of the Persian version of this questionnaire. In 1991, Tiffany et al. [8] conducted the first study to validate the smoking urge questionnaire in the United States. This questionnaire was designed to capture four distinct theoretical and clinical concepts related to the desire to smoke. Their findings revealed a two-factor extraction, where factor 1 encompassed items reflecting intention and desire to smoke, while factor 2 included items related to the prediction of relief from negative affect and nicotine withdrawal symptoms. Similarly, Araujo et al. [13] examined the Brazilian version of the complete QSU questionnaire, revealing two factors: One representing relief from negative effects and nicotine withdrawal symptoms, and the other representing the desire to smoke and predicted pleasure from smoking. This study affirmed the Brazilian version as an adequate and reliable tool for both research and patient treatment.

In the Persian study, Kazemitabar et al. [5] investigated the psychometric properties of the Persian version of the brief QSU, which included 12 items tested in the student population. Their findings supported a 2-factor model and confirmed convergent and divergent validity, internal consistency, and concurrent and discriminant validity. Based on the abovementioned studies, we used the questionnaire and found that the factor load of the items of the QSU in the first subscale was between 0.353 and 0.787, and in the second subscale was 0.248 to 0.706. Furthermore, our findings demonstrated a direct and significant correlation between the QSU and its first subscale with the TCQ, indicating convergent validity between these two assessments.

Moreover, a short 10-item version of the QSU questionnaire was evaluated for Spanish smokers, demonstrating good consistency and reliability [14]. Similarly, Toll et al. [15] assessed the QSU-brief questionnaire, concluding its validity in measuring smoking tendencies in a treatment-seeking population.

Consistent with our study, Ahmed et al. [16] explored the Bengali version of the brief QSU among smokers. They revealed acceptable reliability, validity, and factor structure. This version was considered a valid tool for evaluating smoking tendencies in Bangladeshi environments. In our study, QSU had a Cronbach α of 0.892, similar to the previous study. It was also shown in the last study [17] that the Brief questionnaire had a Cronbach α of more than 0.83 and had good internal stability. Also, Ahmed et al. [16] reported the Cronbach α of the questionnaire as 0.94. According to the results of this study and its agreement with previous studies, this questionnaire has a very high Cronbach α , which indicates

strong measurement capability and good internal stability in this questionnaire. These results showed that the tool used in the study has the appropriate validity and diagnostic power to measure the urgent need to smoke in the community.

Regarding study limitations, our sample was confined to one community, and like any psychometric study, it may encounter issues like bias response and psychological effects. Further research to validate and refine our findings would be beneficial.

Conclusion

The results of this study showed that the investigated questionnaire is a reliable tool for measuring the “urgent need to smoke” in the Persian-speaking community. Further studies across diverse communities and contexts are warranted to enhance the generalizability of the findings. Exploring various factors influencing the urge to smoke, including social, cultural, and psychological aspects, could suggest novel insights for smoker management. Investigating the effectiveness of different interventions and interactions aimed at reducing the immediate urge to smoke and assisting individuals in managing their smoking habits can substantially improve treatment approaches.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of the [Guilan University of Medical Sciences](#) (Code: IR.GUMS.REC.1401.584). All processes of the study were in compliance with the ethical guidelines of the 2013 Declaration of Helsinki.

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Authors contributions

Conceptualization: Homa Zarrabi and Mohammad Hassan Novin; Supervision, investigation, methodology, review and editing: All authors; Writing the original draft: Homa Zarrabi, Mohammad Hassan Novin, and Samin Khoshnoud Speily; Funding acquisition: Homa Zarrabi and Robabeh Soleimani.

Conflict of interest

The authors declared no conflict of interest.

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