

# Translation and psychometric evaluation of the persian version of the treatment satisfaction with medicines questionnaire (SATMED-Q) in chronically-ill patients

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## ABSTRACT

**Introduction:** It is helpful to know the rate of satisfaction with treatment for predicting treatment adherence and compliance with medical advice. Thus, measuring this parameter is important both in daily clinical care and in biomedical research. Due to the unavailability of an instrument to evaluate treatment satisfaction with medicines in Persian, this study dealt with translating and psychometrically evaluating the Persian version of the Treatment Satisfaction with Medicines Questionnaire (SATMED-Q) in chronically ill patients.

**Methods:** This descriptive cross-sectional study was performed in two stages: translation and psychometric evaluation. After obtaining permission from the developer of the questionnaire, the process of translation was carried out based on Wild's model (2005). Face validity (20 chronically-ill patients), qualitative content validity (10 experts), and construct validity including confirmatory factor analysis (225 chronically ill patients), were employed to establish the validity of the questionnaire. Further, the reliability of the instrument was established by determining the internal consistency and intra-class correlation (51 chronically ill patients). The data were analyzed using SPSS23 and LISREL8.5.

**Results:** To assess face and content validity, the questionnaire items underwent modifications based on feedback from patients and experts. According to confirmatory factor analysis, the fit index values demonstrated an appropriate alignment between the model and data. The subscales' Cronbach's  $\alpha$  coefficients ranged from 0.905 to 0.985, while the entire questionnaire's Cronbach's  $\alpha$  coefficient was 0.875. Additionally, the test-retest reliability, as measured via the intra-class correlation coefficient, was determined to be 0.739 over two weeks.

**Conclusion:** The Persian version of the SATMED-Q has appropriate face, content, construct, and criterion-referenced validity as well as reliability for assessing treatment satisfaction with medicines in chronically ill patients. It is also advisable to use it in clinical studies, clinical settings, education, and management.

## Keywords:

Translation

Psychometric evaluation

Treatment satisfaction with medicines

Chronically ill patients

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## Introduction

With increasing age, the incidence of chronic diseases, especially cardiovascular diseases, endocrine diseases, chronic respiratory diseases, and other chronic diseases, also grows (Fereidouni Sarijeh and Khatib 2025; Khatib et al., 2026). On the other hand, people with multiple chronic diseases have the possibility of premature death, increased hospitalization, and extended hospital stays, which affect their health-related quality of life. Meanwhile, the administration of numerous prescription drugs has increased (Skou et al., 2022). It has been reported that approximately one-third of patients over 60 years of age frequently use 5 or more types of medications (Dhalwani et al., 2017), and it has been suggested as one of the reasons for patients' reluctance to take medication (Pound et al., 2005; Reeve et al., 2013). In Iran, the prevalence of multiple drug use was reported to be 28.3%, of which 36.6% experienced continuous use (Ebrahimoghli et al., 2023). Adhering to the prescribed treatment plan is a significant challenge in patients suffering from chronic diseases (Shokri et al., 2013). A review of studies suggested that at least 30-60% of patients with chronic diseases sometimes do not adhere to their treatment plan (Bolsinger et al., 2020); this may lead to poor outcomes, increased wastage of drugs, and use of healthcare resources (Twigg et al., 2016).

Based on the results of some studies, satisfaction with medication and medical treatment is linked to patient adherence to the treatment and is a remarkable indicator that can be employed to improve health care (Ruiz et al., 2008). Patients who consider their treatment as ineffective, experience complications, or perceive that its use has certain drawbacks are less likely to follow treatment advice (López-Torres López et al., 2021). Understanding patient satisfaction with treatment can be instrumental in predicting adherence and informing physicians' decision-making processes. Therefore, evaluating this metric is crucial in both routine clinical practice and medical research (Williams 1994). In the past, most tools planned to assess patient satisfaction with medical care were tailored to specific ailments or clinical scenarios. This approach not only restricted their applicability but also made it challenging to compare satisfaction levels across different diseases or medical contexts. Such limitations hindered the broader utility of these instruments and impeded comprehensive analysis of patient satisfaction across various healthcare settings (Lenderk-

ing 2005). Delestras et al. state that this deficiency in the field of treatment satisfaction with medicines also faces more limitations (Delestras et al., 2013). To the best of our knowledge to date, only two general questionnaires, appropriate for usage in any chronic disease, have been developed to evaluate patient satisfaction. These include the Treatment Satisfaction Questionnaire for Medication (TSQM) (Atkinson et al., 2004), and SATMED-Q (Ruiz et al., 2008). Delestras et al., while confirming the suitability of the two questionnaires in measuring treatment satisfaction with medicines in a comparative study between these two instruments, found that the SATMED-Q obtained overall higher scores than the TSQM in determining validity and reliability indices (Delestras et al., 2013). The SATMED-Q was also developed by Ruiz et al. (2008) at the Autonomous University of Madrid (Universidad Autónoma de Madrid), Spain, as a comprehensive instrument for measuring treatment satisfaction with medicines and was designed for chronically ill patients. This questionnaire contains 17 items in six dimensions: in addition to the four dimensions mentioned in the TSQM questionnaire, i.e. "effectiveness", "complications", "ease of use" and "overall satisfaction"; "the two dimensions" effect of treatment on "ADL" and "quality of medical care" were also added to it (Ruiz et al., 2008). Although this scale enjoys high reliability and validity, the general recommendation is to localize this scale in every cultural context to guarantee its validity. Thus, considering the significant population of chronically ill patients in Iran and the fact that a comprehensive instrument for determining the satisfaction of these patients with drug treatment according to the community's culture was not available at the moment, this study embarked on the translation and psychometric evaluation of the questionnaire SATMED-Q.

## Methods and Materials

### *Study Design*

This cross-sectional descriptive study examined the cultural adaptation and psychometric assessment of the SATME-Q in patients suffering from chronic diseases.

### *Research Sample*

The research population consisted of patients suffering from chronic diseases in Sabzevar, Iran, who were selected via convenience sampling. The inclusion criteria for the study were: literacy in reading and writ-

ing, meeting the criteria of a chronic patient (at least 3 months of illness or at least 1 month of hospitalization per year), having a history of chronic disease for at least 18 months, and adhering to the drug regimen for chronic disease. The exclusion criterion was suffering from mental problems, such as perceptual and communicative disorders that would impair the patient's ability to answer questions based on reasoning.

In the translation phase, two translators proficient in Persian and English conducted forward translation, and two others performed back translation. To assess face validity, 20 patients were selected through purposive sampling. Additionally, 10 experts specializing in chronic disease and instrument development were chosen using the same method to evaluate content validity (Munro 2005). For determining validity in factor analysis, it is generally recommended that the number of participants exceeds the number of variables, with 5-10 individuals needed for every item in the instrument (DeVellis and Thorpe 2021). In this study, 225 patients with chronic disease were selected for confirmatory factor analysis using convenience sampling. Furthermore, 15-30 samples are recommended to establish the reliability of the instrument (Amirrudin et al., 2021); therefore, 15-30 samples out of 51 participated in this research.

#### *Procedure*

Having obtained the necessary permits, the researcher visited specialized treatment centers for chronically ill patients (diabetes, hypertension centers, etc.) and selected treatment centers in Sabzevar, Iran (including Vase'ei Hospital and Heshmatieh Hospital). Then, he selected the samples based on inclusion and exclusion criteria using a convenience sampling method. The study was conducted between July 2022 and August 2023 in two parts: intercultural translation and psychometric assessment.

#### **a. Translation and Cultural Adaptation**

At this stage, after obtaining permission from the developer of the questionnaire, cross-cultural translation was conducted following Wild et al.'s cultural adaptation and translation guide (Wild et al., 2005). The initial two Iranian translators, proficient in both Persian and English languages and cultures, independently translated the instrument from English to Persian. The resulting Persian translations were then consolidated into a single version through expert consultation. In the next

phase, two different translators, also fluent in Persian and English but unfamiliar with the original scale items, performed a back-translation from Persian to English. Finally, the back-translated English version was finalized through expert consultation and consensus. Next, the translations from the target language to the source language were compared with the original version of the questionnaire (in English) and re-reviewed. The questionnaire was then given to 15 patients, who were asked to verbally explain the meaning of each item. This method ensured that the translated items retained the same meaning as the original items. Finally, by reviewing and evaluating the results of the translation process, the final version of the translation was obtained.

#### **b. Psychometric Evaluation**

During this phase, researchers evaluated face validity (qualitative), content validity (qualitative), construct validity (confirmatory factor analysis), and reliability. To assess face validity, 20 patients were given the questionnaire and asked to evaluate the items for difficulty, clarity, and appropriateness (Algoos et al., 2016). For content validity, 10 experts were requested to thoroughly review the instrument and provide comprehensive feedback on the pertinence of items to the concept of interest, the appropriateness of language and wording, and the proper placement of items within the document (Sharma 2022). The research team carefully considered these opinions and made necessary adjustments. Construct validity was determined via confirmatory factor analysis using a sample of 225 patients. Internal consistency was employed to measure reliability. To evaluate consistency reliability, participants completed the Persian version of the instrument twice over a two-week period.

#### *Data Collection Instruments*

##### **a) Demographic Information Questionnaire**

This questionnaire was used to gather information on personal and familial characteristics and medical history of chronically ill patients. It captures variables such as age, gender, level of education, marital status, employment status, type of disease, number of medications administered per day, and daily frequency of drug administration.

##### **b) SATMED-Q**

This questionnaire was initially developed by Ruiz

**TABLE 1:** Demographic characteristics of the respondents

Variables F	Construct validity n=225		Reliability n=51		Total n=276		
	%	F	%	F	%		
Gender	Male	105	46.7	32	62.7	137	49.6
	Female	120	53.3	19	37.3	139	50.4
Age (year)	20-30	16	7.1	4	7.8	20	7.2
	30-40	23	10.22	9	17.6	32	11.6
	40-50	48	21.34	9	17.6	57	20.7
	>50	138	61.34	29	56.9	167	60.5
Education level	Illiterate	67	29.8	11	21.6	78	28.3
	Below diploma	77	34.2	19	37.3	96	34.8
	Diploma	52	23.1	5	9.8	57	20.7
	Associate diploma BA/BS and higher	5 24	2.2 10.6	3 13	5.9 25.4	8 37	2.9 13.4
Marital status	Married	189	84	47	92.2	236	85.5
	Single	36	16	4	7.8	40	14.5
Employment status	Employed	77	34.2	21	41.2	98	35.5
	Housekeeper	94	41.8	16	31.4	110	39.8
	Retired	23	10.2	10	19.6	31	12
	Unemployed	31	13.8	4	7.8	35	12.7
Drug complications	Yes	89	39.6	12	23.5	101	36.6
	No	136	60.4	39	76.5	175	63.4
Number of drugs administered per day	<4	136	60.4	20	39.2	156	56.5
	4-7	61	27.1	19	37.3	80	29
	4-10	18	8	9	17.6	27	9.8
	>10	10	4.4	3	5.9	13	4.7
Frequency of times of drug administration per day	1 or 2	152	67.6	30	58.8	182	66
	3 or 4	71	31.6	21	41.2	92	33.3
	5 or 6	2	0.9	0	0	2	0.7
Involved chronic disease	Multiple sclerosis (MS)	18	8	6	11.8	24	8.7
	Diabetes	53	23.6	12	23.5	65	23.6
	Chronic respiratory disorders	23	10.2	8	15.7	31	11.2
	Cardiovascular diseases and hypertension	71	31.5	14	27.5	85	30.8
	Renal failure	60	26.7	11	21.5	71	25.7

(2008) at the Autonomous University of Madrid, Spain (Ruiz et al., 2008). The original version of the questionnaire had 36 items, which were later reduced to 17 items after psychometric evaluation. By 2022, this instrument had been translated into more than 10 languages, including English, French, German, Polish, etc. and had been psychometrically evaluated in various populations of chronically ill patients, such as hypertensive, diabetic, and heart failure patients. The questionnaire consists of 17 items scored on a 5-point Likert scale spanning from ‘not at all’ receiving 0 points to ‘very much’ receiving

4 points in 6 dimensions: adverse side-effects (items 1 to 3), treatment effectiveness (items 4-6), ease of medication intake (items 7-9), the effect of treatment impact on activities of daily living (items 10 to 12), quality of medical care (items 13 and 14), and overall satisfaction (items 15 to 17). To calculate the score, the sum of points for individual items is multiplied by 1.471 to obtain a percentage of satisfaction. A higher percentage indicates greater patient satisfaction with pharmaceutical treatment (Ruiz et al., 2008).

**TABLE 2:** Values of model fit indices and fitting results

Fit index	Acceptable value	Model value	Interpretation
$\chi^2$ to degrees of freedom ( $\chi^2/df$ )	<3.00	1.84	Good fit
Goodness of fit index (GFI)	>0.90	0.99	Good fit
Adjusted Goodness of Fit Index (AGFI)	>0.90	0.95	Good fit
Root Mean Square of Residuals (RMR)	<0.05	0.020	Good fit
Normalized Fit Index (NFI)	>0.90	0.92	Good fit
Non-normal Fit Index (NNFI)	>0.90	0.95	Good fit
Incremental Fit Index (IFI)	>0.90	0.97	Good fit
Comparative Fit Index (CFI)	>0.90	0.96	Good fit
Root Mean Square of Error Approximation (RMSEA)	<0.08	0.064	Good fit

### Data Analysis

To assess the model fit,  $\chi^2/df$ , Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Residual (RMR), Normal Fit Index (NFI), Incremental Fit Index (IFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) were utilized (Levine 2015). Factor loadings greater than 0.3 were considered acceptable (Souza et al., 2017). To verify the adequacy of the sample, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were conducted. A KMO value above 0.5 is deemed acceptable (Munro 2005; Pett 2003), and Bartlett's test of sphericity should be less than 0.05 (Lovric 2011). Reliability was assessed using Cronbach's  $\alpha$  coefficient and intra-class correlation coefficient (ICC). Cronbach's  $\alpha$  and ICC values exceeding 0.7 are considered satisfactory for interpretation (Souza et al., 2017). Data analysis was performed using SPSS23 and LISREL8.5.

### Ethical Considerations

The Committee of Ethics in Human Research at Islamic Azad University, Isfahan (Khorasgan) branch, granted approval for this study under the ethics code IR.IAUKHUISF.REC.1401.165. After receiving a comprehensive explanation of the study's purpose, nature, and relevant procedures, all participants provided their written informed consent. Additionally, every patient completed all required questionnaires. The study was carried out while fully observing the principles outlined in the Declaration of Helsinki.

### Results

All 225 distributed questionnaires were completed and analyzed. According to the findings outlined in Table 1, the mean age of the participants was  $54.39 \pm 15.04$  years. The majority of the participants were female (50.4%), married (85.5%), held a bachelor's degree (34.8%), and were housewives (39.8%). Based on the findings, the majority of patients took less than 4 medicines (56.5%) and less than 3 times per day (66%) (Table 1).

#### Results of Face Validity

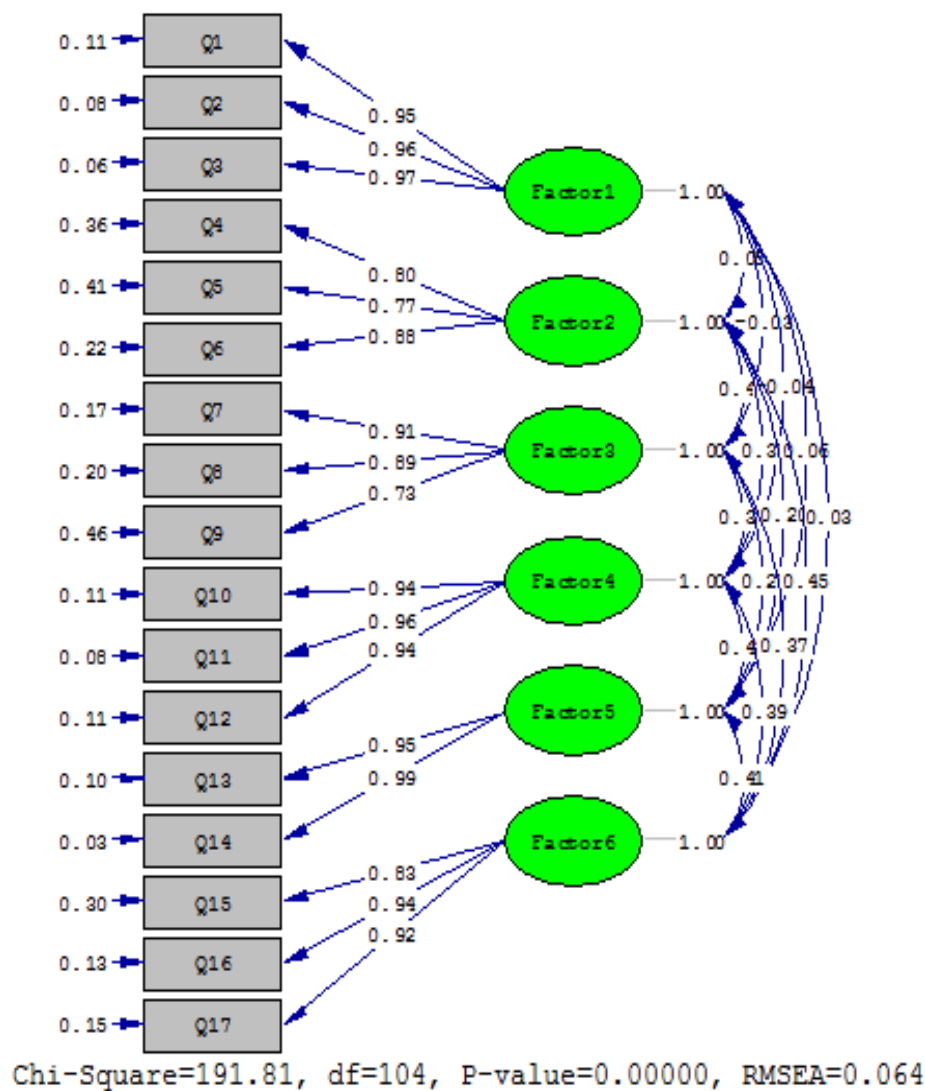
The qualitative face validity assessment involved evaluating patients' perspectives on the clarity and unambiguity of the questionnaire items. Following modifications to 4 items (1, 7, 14, and 15), patients found all items to be comprehensible, with no ambiguities remaining. As such, the Persian adaptation of this questionnaire was considered conceptually clear, suitable, and adequate.

#### Results of Content Validity

Regarding the qualitative content validity, the recommendations made by experts were implemented to ensure item relevance to the intended concept, appropriate word choice, and correct item placement. As a result, four items (2, 10, 14, and 16) underwent modifications based on these suggestions.

#### Results of Construct Validity

To check the construct validity and confirm the questionnaire dimensions using AMOS, confirmatory factor analysis was applied. The KMO index was found to be



**FIGURE 1.** Confirmatory factor analysis for SATMEQ in standard mode

0.795, and Bartlett’s test was significant ( $\chi^2=3817.074$ ,  $F=136$ , &  $P<0.001$ ). These findings revealed that the data-set was fit for factor analysis. Table 2 lists the fit indices of the model, with all indices confirming the model.

Figure 1 demonstrates the SATMED-Q model dimensions in standard and significant modes.

Factor 1: Undesirable complications including items 1 to 3; Factor 2: Effectiveness of treatment including items 4 to 6; Factor 3: Ease and convenience of taking medicine including items 7 to 9; Factor 4: Effect of treatment on ADL including items 10 to 12; Factor 5: The quality of medical care including items 13 and 14; and factor 6: The overall satisfaction of patients including items 15 to 17. All indices and components had a factor load greater than 0.3, and the membership of all studied factors in

this variable has been confirmed (Figure 1).

*Results of Reliability Establishment*

To assess reliability, researchers employed internal consistency and the intra-class correlation coefficient methods. The Cronbach’s  $\alpha$  exceeded 0.7 for all subscales and the entire test, demonstrating adequate internal correlation within each subscale and the entire instrument (Table 3). Using the Two-Way Mixed model, the intra-class correlation coefficients (ICC) between scores from two separate administrations of the scale were calculated. The Single Measure ICC was determined to be 0.98, with a 95% confidence interval. This result supports the acceptability and appropriateness of the reliability in terms of time consistency or repeatability of the questionnaire (Table 3).

**TABLE 3:** Intra-class correlation coefficient for each dimension and the entire questionnaire

Dimensions	CI (95%)	ICC
Adverse complications	0.867-0.960	0.924
Effectiveness of treatment	0.669-0.888	0.798
Ease and convenience of taking medicine	0.376-0.748	0.577
The effect of treatment on ADL	0.901-0.971	0.944
Quality of medical care	0.864-0.967	0.932
Overall patient satisfaction	0.536-0.831	0.730
The whole scale	0.649-0.881	0.739

## Discussion

Having valid and reliable instruments or scales, including standard questionnaires, is the first prerequisite to properly conduct studies related to patient treatment satisfaction with medicines. When an instrument is translated from one language into another, its psychometric characteristics and measurement quality should be studied in terms of validity and reliability (Tsai et al., 2024). The present study dealt with the translation and examination of the psychometric properties of the Persian version of the Treatment Satisfaction with Medicines Questionnaire (SATMED-Q) in chronically ill patients. Firstly, the instrument was translated. One of the basic goals in the process of translating the questionnaire is adjusting its cultural compatibility to the target community (Clayton et al., 2021). According to Gilman, if cultural equality is observed by the team of translators during the back-translation, it can be claimed that the questionnaire has been translated in accordance with the principles of cultural compatibility (Guillemin et al., 1993). The above questionnaire was translated by competent and knowledgeable scholars according to the principles of translation and caring for its right process and accuracy in cultural compatibility via following the Wild model (Wild et al., 2005). In the psychometric evaluation phase, a qualitative method was utilized to determine the face validity. The results of this phase of the study revealed that after applying a small change in the above questionnaire, the patients found no difficulty in understanding the instrument and thus, all items were retained. In the validation of the Spanish version of the instrument, performed by Lopez et al., 17 items of the questionnaire were retained. The findings of this part of the research are in line with the results of this study (Ruiz et al., 2008). Many scholars believe that face va-

lidity is a part of content validity and these two are not separate from each other (Taghizadeh et al., 2017). In this regard, in the current research, according to the advice of experts, some items were edited and its content validity was confirmed. The process of reviewing the clarity and equivalence of the content provided more support for conceptual, semantic and content equivalence together with the syntactic structure employed in the translated version (Connolly et al., 2018; Jain 2014). To establish construct validity, the values of all fit indices presented the acceptable and suitable state of the model as well as data, and it enjoyed an acceptable fit. This finding is concordant with the results obtained by Świątoniowska-Lonc et al. for the psychometric evaluation of SATMED-Q among the population of Polish patients with chronic problems of heart failure, Type II diabetes, and hypertension (Świątoniowska-Lonc et al., 2022). Reliability of an instrument is a key criterion revealing the quality of the instrument. The reliability of this scale was checked with Cronbach's  $\alpha$  coefficient and test-retest; the results demonstrated acceptable internal consistency and stability for this instrument. Consistent with the present study, Świątoniowska-Lonc et al. reported a Cronbach's  $\alpha$  value of 0.847 for the entire scale (Świątoniowska-Lonc et al., 2022).

### Limitations of the Study

This study had several constraints, including the use of convenience sampling and the lack of assessment of convergent and divergent validity. Additionally, due to the limited number of items and the straightforward nature of the scale's content, only qualitative methods were used to evaluate content validity. The research did not include an examination of the content validity ratio (CVR) or content validity index (CVI).

## Conclusion

Overall, the Persian adaptation of the SATMED-Q exhibited satisfactory psychometric characteristics and cultural appropriateness. The Persian translation was clear and easily understandable for patients, as it did not contain ambiguous or technical terminology. Face and content validity assessments of the Persian SATMED-Q indicated that the instrument has an appropriate appearance and would be well-suited for assessing medication satisfaction in patients with chronic conditions. The questionnaire's construct validity confirmed that it could effectively measure the intended concepts and constructs from its original version, making it acceptable in this regard. Additionally, the Persian version's reliability was established through its strong internal consistency and confirmed repeatability, as evidenced by acceptable scores. These factors collectively support the instrument's reliability.

### *Ethics approval and consent to participate*

This research was approved by the Committee of Ethics in Human Research at Islamic Azad University, Isfahan (Khorasgan) branch with code of ethics: IR.IAUKHUISF.REC.1401.165. All participants signed informed written consent after the relevant procedures and the purpose of the study were fully explained. Also, all patients completed all questionnaires. All participants first filled out an informed consent form and then entered the study. All methods were carried out in accordance with relevant guidelines and regulations.

## Consent for publication

“Not applicable”

## Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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## Authors' contributions

All authors (MB-SH, AK, and MMP) have participated in the conception and design of the study. AK and MMP contributed the data collection. AK prepared the

first draft of the manuscript. MB-SH critically revised and checked closely the proposal, the analysis and interpretation of the data. MB-SH has been involved in revising the manuscript critically. All authors read and approved the final manuscript.

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## Competing interests

“The authors declare that they have no competing interests”

## List of abbreviations

SATMED-Q: Treatment Satisfaction with Medicines Questionnaire, TSQM: Treatment Satisfaction Questionnaire for Medication, ADL: Activities of Daily Living,  $\chi^2$ : Chi-square, df: Degrees of Freedom, RMSEA: Root Mean Square Error of Approximation, NFI: Normed Fit Index, GFI: Goodness of fit index, AGFI: Adjusted goodness of fit index, KS: Kolmogorov-Smirnov, KMO: Kaiser-Meyer-Olkin, CVI: Content Validity Index, CVR: Content Validity Ratio.

## References

- Algo M, Peters K, Ramjan L, East L. Adaptation and validation of a survey instrument measuring perceived preparedness of nursing graduates. *Nurse Researcher* 2016; 23. <https://doi.org/10.7748/nr.2016.e1437>
- Amirrudin M, Nasution K, Supahar S. Effect of variability on Cronbach alpha reliability in research practice. *Jurnal Matematika, Statistika dan Komputasi* 2021; 17: 223-230. <https://doi.org/10.20956/jmsk.v17i2.11655>
- Atkinson M J, Sinha A, Hass S L, Colman S S, Kumar R N, Brod M, et al. Validation of a general measure of treatment satisfaction, the treatment satisfaction questionnaire for medication (TSQM), using a national panel study of chronic disease. *Health and Quality of Life Outcomes* 2004; 2: 1-13. <https://doi.org/10.1186/1477-7525-2-12>
- Bolsinger J, Jaeger M, Hoff P, Theodoridou A. Challenges and opportunities in building and maintaining a good therapeutic relationship in acute psychiatric settings: A narrative review. *Frontiers in Psychiatry* 2020; 10: 965. <https://doi.org/10.3389/fpsy.2019.00965>
- Clayton S, Czellar S, Nartova-Bochaver S, Skibins J C, Salazar G, Tseng Y-C, et al. Cross-cultural validation of a re-

- vised environmental identity scale. *Sustainability* 2021; 13: 2387. <https://doi.org/10.3390/su13042387>
- Connolly M, McLean S, Guerin S, Walsh G, Barrett A, Ryan K. Development and initial psychometric properties of a questionnaire to assess competence in palliative care: palliative care competence framework questionnaire. *American Journal of Hospice and Palliative Medicine®* 2018; 35: 1304-1308. <https://doi.org/10.1177/1049909118772565>
- Delestras S, Roustit M, Bedouch P, Minoves M, Dobremez V, Mazet R, et al. Comparison between two generic questionnaires to assess satisfaction with medication in chronic diseases. *PloS One* 2013; 8: e56247. <https://doi.org/10.1371/journal.pone.0056247>
- DeVellis R F, Thorpe C T. *Scale development: Theory and applications*: Sage Publications, 2021.
- Dhalwani N N, Fahami R, Sathanapally H, Seidu S, Davies M J, Khunti K. Association between polypharmacy and falls in older adults: a longitudinal study from England. *BMJ Open* 2017; 7: e016358. <https://doi.org/10.1136/bmjopen-2017-016358>
- Ebrahimoghli R, Janati A, Gharaee H, Aghaei M H. Polypharmacy pattern in Iran: a comprehensive analysis of a large prescription database. *Iranian Journal of Pharmaceutical Research* 2023; 21: e131304. <https://doi.org/10.5812/ijpr-131304>
- Fereidouni Sarijeh P, Khatib A. The Impact of Resurrection Beliefs on Resilience and Loneliness among Elderly Individuals in Tehran. *Evidence Based Care* 2025; 15: 46-53. <https://10.0.86.22/EBCJ.2025.84011.3059>
- Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *Journal of Clinical Epidemiology* 1993; 46: 1417-1432. [https://doi.org/10.1016/0895-4356\(93\)90142-N](https://doi.org/10.1016/0895-4356(93)90142-N)
- Jain V. 3D model of attitude. *International Journal of Advanced Research in Management and Social Sciences* 2014; 3: 1-12.
- Khatib A, Gazerani A, Fereidouni Sarijeh P, Pazhavand M, ebrahimi M a, Ranjbari B. Resilience and loneliness among older adults: an analysis using decision tree techniques. *Aging Clinical and Experimental Research* 2026; 38: 2-8. <https://doi.org/10.1007/s40520-025-03266-3>
- Lenderking W R. Brief reflections on treatment satisfaction. *Value in Health* 2005; 8: S2-S5. <https://doi.org/10.1111/j.1524-4733.2005.00068.x>
- Levine T R. Confirmatory factor analysis. *The International Encyclopedia of Interpersonal Communication* 2015: 1-5. <https://doi.org/10.1002/9781118540190.wbeic183>
- López-Torres López J, Rabanales-Sotos J, López-Torres Hidalgo M R, Milián García R M, López Martínez C, Blázquez Abellán G. Reliability and validity of the treatment satisfaction with medicines questionnaire (SATMED-Q) in persons with arterial hypertension. *International Journal of Environmental Research and Public Health* 2021; 18: 3212. <https://doi.org/10.3390/ijerph18063212>
- Lovric M. *International encyclopedia of statistical science*. Springer Nature 2011. <https://doi.org/10.1007/978-3-642-04898-2>
- Munro B H. *Statistical methods for health care research*. Vol 1: Lippincott Williams & Wilkins, 2005.
- Pett M. *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Thousand Oaks 2003. <https://doi.org/10.4135/9781412984898>
- Pound P, Britten N, Morgan M, Yardley L, Pope C, Daker-White G, et al. Resisting medicines: a synthesis of qualitative studies of medicine taking. *Social Science & Medicine* 2005; 61: 133-155. <https://doi.org/10.1016/j.socscimed.2004.11.063>
- Reeve E, Wiese M D, Hendrix I, Roberts M S, Shakib S. People's attitudes, beliefs, and experiences regarding polypharmacy and willingness to deprescribe. *Journal of the American Geriatrics Society* 2013; 61: 1508-1514. <https://doi.org/10.1111/jgs.12418>
- Ruiz M A, Pardo A, Rejas J, Soto J, Villasante F, Aranguren J L. Development and validation of the "treatment satisfaction with medicines questionnaire"(SATMED-Q)©. *Value in Health* 2008; 11: 913-926. <https://doi.org/10.1111/j.1524-4733.2008.00323.x>
- Sharma S. *Nursing research and statistics-e-book*: Elsevier Health Sciences, 2022.
- Shokri A, Yazdan Panah A, Vahdat S. The professional relationship between the nurses and physicians from their own point of view. *Journal of Health and Care* 2013; 15: 76-69.
- Skou S, Mair F, Fortin M, Guthrie B, Nunes B, Miranda J, et al. Multimorbidity. *Nature Reviews Disease Primers*. 2022; 8(1):48. <https://doi.org/10.1038/s41572-022-00376-4>
- Souza A C d, Alexandre N M C, Guirardello E d B. Psychometric properties in instruments evaluation of reliability and validity. *Epidemiologia e Servicos de Saude* 2017; 26: 649-659. <https://doi.org/10.5123/S1679-49742017000300022>
- Świątoniowska-Lonc N, Kołtuniuk A, Jankowska-Polańska B. Psychometric properties of the treatment satisfaction with medicines questionnaire (SATMED-Q) in patients with diabetes, arterial hypertension and heart failure. *International*

- al Journal of Environmental Research and Public Health 2022; 19: 1088. <https://doi.org/10.3390/ijerph19031088>
- Taghizadeh Z, Ebadi A, Montazeri A, Shahvari Z, Tavousi M, Bagherzadeh R. Psychometric properties of health related measures. Part 1: Translation, development, and content and face validity. *Payesh (Health Monitor)* 2017; 16: 343-357.
- Tsai T-I, Luck L, Jefferies D, Wilkes L. Challenges in adapting a survey: ensuring cross-cultural equivalence. *Nurse Researcher* 2024; 32.
- Twigg M J, Bhattacharya D, Clark A, Patel R, Rogers H, Whiteside H, et al. What do patients need to know? A study to assess patients' satisfaction with information about medicines. *International Journal of Pharmacy Practice* 2016; 24: 229-236. <https://doi.org/10.1111/ijpp.12252>
- Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al. Principles of good practice for the translation and cultural adaptation process for patient-reported outcomes (PRO) measures: report of the ISPOR task force for translation and cultural adaptation. *Value in Health* 2005; 8: 94-104. <https://doi.org/10.1111/j.1524-4733.2005.04054.x>
- Williams B. Patient satisfaction: a valid concept? *Social Science & Medicine* 1994; 38: 509-516. [https://doi.org/10.1016/0277-9536\(94\)90247-X](https://doi.org/10.1016/0277-9536(94)90247-X)