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"TANGO" nocturia scanning tool: Turkish validity and reliability study

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Abstract

Background: The aim of this study is to evaluate the validity and reliability of the Targeting the Individual's Aetiology of Nocturia to Guide Outcomes (TANGO) screening tool, which is used to determine nocturia etiology.

Methods: Patients hospitalized in urology, orthopedics, and general surgery clinics between September 2019 and January 2020 were included in the study. Demographic characteristics of the participants such as age, gender, drug use, and nocturia severity were assessed by the researchers. The Turkish version of the TANGO questionnaire consisting of 22 questions was filled in by the patients. The patients were asked to repeat the same test 4 weeks later.

Results: A total of 124 patients were included in the study. The mean age of the patients participating in the study was 51.20 ± 18.50 (38-82). The result of the reliability assessment showed that the total score intraclass correlation coefficient was 0.715 (individual item score weighted kappa coefficients, 0.696-0.731) and the Cronbach's alpha coefficient was 0.727.

A total of 112 patients filled in the TANGO screening tool again after 4 weeks. The test-retest reliability analysis kappa value was 0.75 (0.68-0.83). In the validity analysis, a moderately positive correlation was observed between the TANGO-Urinary Incontinence Score and the number of nocturia (r = 0.452, *P* = .003).

Conclusion: According to the validation study, the TANGO screening tool is valid and reliable to determine the nocturia etiology for the Turkish population.

KEYWORDS

cardiac, etiological factor, nocturia, sleep, urinary

1 | INTRODUCTION

Nocturia is defined as a complaint of waking up to urinate one or more times during night.[1] This symptom usually affects a high proportion of adults[2] and results in significant negative consequences in terms of patient health, sleep, and quality of life.[3] There is no consensus on the diagnosis and evaluation of nocturia patients. Poorly evaluated nocturia has significant morbidity and is associated with impaired overall well-being.[4]

The cause of nocturia is influenced by multiple factors and varies from patient to patient.[5] Blood pressure changes, cardiometabolic dysfunction, fluid accumulation in the lower extremities, polyuria, sleep apnea, insomnia, polypharmacy, and lower urinary tract symptoms (LUTS) can all be the cause of nocturia.[3] Each patient may have more than one etiological cause. International guidelines suggest clinical evaluation, including history taking, physical examination, and disease-specific questionnaires (DSQ) as diagnostic tools.[3]

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According to a consensus published in 2018, the DSQ, post-voiding residual urine, and a bladder diary are required to assess nocturia.[3] Nocturia cannot be fully resolved with a single treatment method.[6]The only evidence-based drug for nocturia is desmopressin.[7] However, its use in clinical practice is limited.[8]

The Targeting the Individual's Aetiology of Nocturia to Guide Outcomes (TANGO) questionnaire is a patient self-administered, short screening tool designed to assist in assessing nocturia and diagnosing possible etiological factors of nocturia.[9] TANGO's internal consistency, test-retest reliability, and content validity were previously published[10] and also recently validated in Dutch language.[11]

The main purpose of this study is to evaluate the validity and reliability of the Turkish version of TANGO (TANGO-Turkish). The secondary aim of the study is to examine the etiological factors in nocturia.

2 | METHODS

This methodological descriptive research was conducted between September 2019 and January 2020.

The study was accepted by the local ethics committee with a 2019/16 institutional review board approval. Before the study, informed consent was taken from all the patients, and they were assured of their right to refuse to participate or to withdraw from the study at any stage. The study was designed in accordance with the Helsinki Declaration.

2.1 | Instrument

The self-administered TANGO questionnaire consists of 22 items measuring 4 dysfunction areas: cardiovascular and metabolic status (7 items), sleep (6 items), urinary tract (5 items), and well-being (4 items)[9] (see Appendix S1). If "true" was the answer for each question, the items were scored. No points were taken for the answer "false." The positive scores of the patients from each dysfunction group were collected and divided by the total number of questions in that group. Among the four factors, the factors with the highest values were recorded as possible causes of nocturia.

2.2 | Translation and cross-cultural adaptation

2.2.1 | Language validity

The researchers contacted the developer of TANGO and allowed to translate the English version of TANGO (source) to the Turkish version. First, the TANGO questionnaire was translated from English to Turkish by six health care professional (three urologists and three registered nurse academicians) and two independent native Turkish-speaking translators (with English as their first foreign language) for content validity. Then a consensus meeting was held with the translators, urologists, and registered nurses. Comparability of language and similarity of interpretability were rated on a 7-point Likert scale: 1 = extremely comparable/similar through to 7 = not at all comparable/similar. Any mean score >3 in the language dimension or >2.5 in the interpretability dimension necessitated a formal review of the translation. Items receiving poor mean scores were revised and back translated until the mean scores indicated a valid version.

The backward translation of the draft text was done by two professionals (one urologist and one registered nurse) and independent translators. Backward translation into English was carried out by bilingual native English speakers not involved in the translation stage.

Finally, the researchers performed a pilot test on five patients with nocturia. Necessary changes were made, and it was assumed that TANGO-Turkish was ready to use. It was also sent to the original author (Bower W) to compare the English translation of TANGO-Turkish and the original versions.

Patients admitted to urology, orthopedics, and general surgery outpatient clinics between September 2019 and January 2020 were included in the study (N = 124). Patients with ≥1 nocturia symptom were included in the study. Inclusion criteria for the study were: the ability to read and write Turkish, to understand what they read, and age over 18 years old. Patients younger than 18 years old, patients receiving active nocturia treatment, illiterate Turkish patients, patients who do not understand what they read, and patients who did not agree to participate in the research were excluded from the study.

The demographic characteristics of the participants, such as age, gender, drug use, and nocturia severity, were assessed by the researchers. Nocturia severity was measured using the following question from the International Consultation on Incontinence Questionnaire for Nocturia (ICIQ-Nocturia): "During the night, how many times do you have to get up to urinate, on average?"[12] The TANGO-Turkish inquiry form consisting of 22 questions was filled in by the patients. The patients were asked whether there were any expressions, words, or content that they did not understand, and their comments were taken into account when deciding which words would better express the intended meaning.

To evaluate the test-retest validity 4 weeks after the first visit, participants had to fill in again the TANGO-Turkish form (n = 112). Also, etiology factors of nocturia were assessed.

2.2.2 | Internal consistency and reliability

The internal consistency was analyzed by Cronbach's alpha coefficient and item analysis, and its reliability was examined by the consistency over time by the test-retest method for TANGO-Turkish.

Concurrent validity was evaluated by the degree of correlation with external criteria (ICIQ-Nocturia). The correlation coefficient was interpreted according to the standard proposed by Cohen: A correlation coefficient of 0.1 was considered to be weak, 0.3 medium, and 0.5 strong.[13] Test-retest reliability was evaluated to measure the extent of the consistency of the results between two time points among patients who completed both the first and second survey

applications. For test-retest reliability, the intraclass correlation coefficient (ICC) was calculated for the total score, and the weighted kappa coefficient was calculated for each item.

2.3 | Statistical analysis

Statistical analyses were carried out with the IBM Statistics Package for Social Sciences Statistics 22.0 (IBM SPSS Statistics, Armonk, New York), and appropriate methods were used to evaluate multiple steps. The level of significance was set at $P < .05$. Internal consistency reliability was tested by Cronbach's alpha, and test-retest reliability was evaluated with the Wilcoxon signed rank test. Spearman correlation analysis was used for simultaneous external validity. Sufficient consistency and reliability were assumed for values >0.70.

TABLE 1 Characteristics of the patients (N = 124)

Characteristics	Mean ± SD	Min-Max
Age	51.20 ± 18.50	38-82
Daily water intake (mL)	1722.18 ± 781.71	1250-5000
Nocturia (times/d)	1.15 ± 1.26	0-5
	n	**%**
Gender		
Male	75	60%
Female	49	40%
Educational level		
Literate	10	8%
Primary school	85	68%
High school	17	13.6%
University	10	8%
Other	2	2.4%
Marital status		
Married	80	64%
Single	44	36%
Working status		
Yes	27	21.6%
No	97	78.4%
Chronic disease		
None	70	56%
Diabetes mellitus	18	14.4%
Hypertension	25	20%
Thyroid disease	2	1.6%
Musculoskeletal	5	4%
Renal disease	2	1.6%
Lung disease	2	1.6%
Cardiovascular disease	1	0.8%
Drug usage		
Yes	73	58.4%
No	51	41.6%
Nocturia		
1	53	42.4%
2-3	51	40.8%
4-5	20	16.8%

3 | RESULTS

A total of 124 patients were included in the study. The mean age of the patients participating in the study was 51.20 ± 18.50 (38-82), 75 (60%) were male and 49 (40%) female, and 56% of the patients had no chronic diseases. The mean number of daily nocturia of the patients was 1.15 ± 1.26 (1-5). The demographic properties of the patients are given in Table 1.

The results of the reliability assessment showed that the total score ICC was 0.715 (individual item score weighted kappa coefficients, 0.696-0.731), and the Cronbach's alpha coefficient was 0.727. Table 2 shows the proportions of answers to the questions.

A total of 112 patients filled in the TANGO screening tool after 4 weeks again. The test-retest reliability analysis kappa value was 0.75 (0.68-0.83). In the validity analysis, a moderately positive correlation was observed between the TANGO-Urinary Incontinence Score and the number of nocturia ($r = 0.452$, $P = .003$).

TABLE 2 Scores of the patients' responses to TANGO-Turkish

Questions	True (%)	False (%)
1	37 (29.8)	87 (70.2)
2	7 (5.6)	117 (94.4)
3	11 (8.9)	113 (91.1)
4	26 (21)	98 (79)
5	26 (21)	98 (79)
6	23 (18.5)	101 (81.5)
7	15 (12.1)	109 (87.9)
8	37 (29.8)	87 (70.2)
9	47 (37.9)	77 (62.1)
10	51 (41.1)	73 (58.9)
11	21 (16.9)	103 (83.1)
12	44 (35.5)	80 (64.5)
13	42 (33.9)	82 (66.1)
14	42 (33.9)	82 (66.1)
15	37 (29.8)	87 (70.2)
16	33 (26.6)	91 (73.4)
17	13 (10.5)	111 (89.5)
18	19 (15.3)	105 (84.7)
19	55 (44.4)	69 (55.6)
20	15 (12.1)	109 (87.9)
21	49 (39.5)	75 (61.3)
22	61 (49.2)	63 (50.8)

Abbreviation: TANGO, Targeting the Individual's Aetiology of Nocturia to Guide Outcomes.

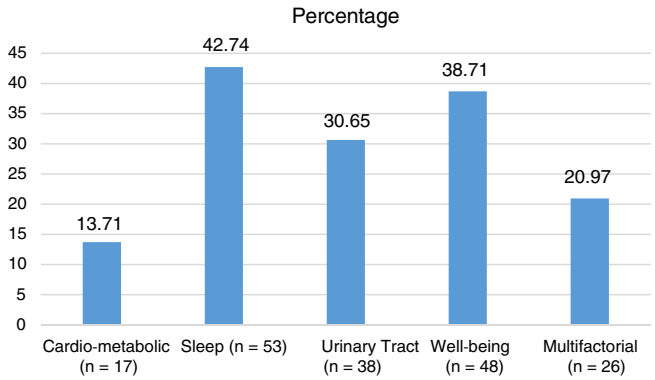


FIGURE 1 Distribution of possible etiological factors of nocturia

When the etiological causes of nocturia were evaluated, more than one etiological cause was observed in 26 (20.97%) of the patients. The most common causes of nocturia among patients were sleep problems and well-being problems (42.74% for sleep and 38.71% for well-being) (Figure 1).

4 | DISCUSSION

TANGO is a screening tool that can be applied by the patients themselves to help health care providers such as doctors, nurses, and physicians identify clinically related comorbidities with nocturia complaints. In this study, using data of patients suffering from nocturia in Turkey, the validity and reliability of TANGO-Turkish were evaluated. Test-retest reliability and ICC were evaluated to assess reliability. The ICC for this study was more than 0.7, which provided a sufficient condition for clinical trials (0.715). For internal consistency, a Cronbach's alpha value with a coefficient of 0.727 was calculated, and the questionnaire was found to be valid. The value of Cronbach's alpha depends on the correlations between the items and the number of items in the questionnaire.

Finding the factors that cause nocturia in nocturia patients may face obstacles. In addition to history and physical examination, DSQ facilitate the diagnosis. Examples of nocturia-specific questionnaires are: ICIQ-Nocturia, the Nocturia Quality-of-Life Questionnaire, and the Nocturia Impact Diary. Compared with these surveys, TANGO is useful in evaluating and identifying comorbidities that may be associated with nocturia. Many comorbidities related to common nocturia etiology can be evaluated by TANGO (cardiovascular disease, sleep problems, urinary symptoms, well-being), and it generally facilitates comprehensive assessment for coexisting causes beyond acceptance as a subset of LUTS.[14,15] Later, health care providers should investigate the basis of clinically relevant dysfunction interfering with nocturia and a multidisciplinary treatment approach.

In the TANGO-Turkish validation study, the internal consistency of the questionnaire was found to be reliable. In addition, the test-rest variability applied to evaluate the time invariance was found to be highly compatible. In addition, a positive correlation was found between the number of nocturia and urinary symptom scores. This indicates that the TANGO-Turkish questionnaire can be applied reliably in the Turkish population.

Although lower urinary system problems play a leading role in nocturia, it is thought that more than one factor plays a role. Usually waking up to urinate at night is associated with poor quality of life.[16] When the etiological factors of the patients participating in the study were examined, it was seen that approximately 20% of the patients had more than one comorbidity. In addition, when these factors were examined, it was observed that sleep and well-being symptoms were found more in the patients than LUTS.

The relationship between sleep and nocturia has been well studied in older populations, but the causality aspect is uncertain.[17] An average of 7 to 8 hours of unfragmented sleep is necessary to maintain a healthy life.[18] Nocturia and anxiety are the most common causes of sleep disturbance. TANGO evaluates distinctive substances related to insomnia, sleep quality, and sleep-disordered breathing and interprets the most clinically important aspects of each of these symptoms.

The study has some limitations. The first is that patients were not evaluated with a bladder diary, and nocturia numbers were evaluated with a single question directed to the patients. However, in previous studies, it has been shown that the bladder diary correlates with the questionnaire.[19] Another limitation is that the test was not repeated after the patients were given specific nocturia treatment.

5 | CONCLUSION

According to the validation study, the TANGO screening tool is valid and reliable to determine nocturia etiology for the Turkish population. When the possible causes of nocturia are examined, it should be remembered that sleep problems play an important role, and the possible causes of nocturia are multifactorial.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA ACCESSIBILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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