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The Effect of Nocturia Etiology on Quality of Life in Individuals Over the Age of 65

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ABSTRACT

Objective: This study aims to evaluate the effect of nocturia etiology on quality of life (QoL) in individuals over 65 years of age.

Materials and Methods: Quantitative descriptive and correlational design was used. The study was carried out with 102 patients aged 65 and over, who were followed up in the Urology Outpatient Clinic of a city hospital in Istanbul between November 2021 and April 2022. Structured Information Form, tracking and assessing nocturia to guide outcomes (TANGO) Nocturia Screening Tool, and the Short Form-36 Health Survey were used.

Results: The mean daily fluid intake of the patients was 1906.86±801.39 L, and the average number of urinations at night was 3.77±1.33. When the relationship between the number of nocturia episodes and the QoL of the patients was examined, a negative and statistically significant difference was found between the number of nocturia episodes and the mean physical functioning (p=0.001), bodily pain (p=0.000), and role-physical (p=0.000) scores.

Conclusion: This study revealed that the urinary tract etiological factor in the TANGO screening tool is the most dominant factor influencing the elderly with nocturia. The study further showed that the participants had a moderate level of QoL, and the most affected QoL sub-dimension is role-physical.

Keywords: Elderly, Nocturia, Quality of life, Urology

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INTRODUCTION

Nocturia is one of the most prevalent symptoms of lower urinary tract issues that can negatively impact one's quality of life (QoL). The likelihood of experiencing nocturia rises as individuals get older. Approximately 40% of both men and women in their 60s experience this condition, while the incidence increases to about 50% in those aged 80 and above.[1,2]

The primary risk factor for developing nocturia is advancing age. With aging, the urinary system undergoes several changes, such as a reduction in bladder capacity, a decrease in urinary flow rate, diminished ability to postpone urination and impaired kidney function.[3] The causes of nocturia can be indicative of serious underlying systemic issues, including cardiovascular, respiratory, endocrine, and metabolic diseases. It may also stem from age-related alterations in the lower uri-

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nary system, various hypervolemic conditions, modifications in medication due to aging, and shifts in lifestyle and sleep quality.[3-5]

Nocturia leads to significant negative consequences in terms of general well-being and sleep quality of the individual.[1,5,6] Poor sleep quality negatively affects the individual's QoL.[7] Since nocturia is the leading cause of sleep disruption, it can cause daytime fatigue, increased susceptibility to diseases, impaired cognitive performance, depression, insomnia-related accidents, and death. With advanced age, nocturia causes an increase in the risk of both falling and hip fracture, and this increase can be more prominent especially in motor and cognitive dysfunctions.[1,2,8] Nocturia can exacerbate symptoms of coexisting chronic conditions. As a result, addressing nocturia, particularly in older adults, has the potential to enhance quality of sleep and overall QoL while also alleviating certain symptoms linked to chronic diseases.[8]

It is the responsibility of healthcare professionals to define the early signs and symptoms and etiology of nocturia, which significantly increases mortality and morbidity in elderly individuals, and to follow approaches to eliminate it and increase the QoL. No studies have yet investigated the effect of nocturia etiology on QoL.[6,8,9] This study sought to investigate how the underlying causes of nocturia impact the QoL in individuals aged 65 and older.

MATERIALS AND METHODS

This study aimed to examine the impact of nocturia's underlying causes on the QoL in individuals aged 65 and older.

Setting and Participants

The study included 102 participants aged 65 and above who were followed up at the Urology Outpatient Clinic of a city hospital in Istanbul between November 2021 and April 2022. Eligible participants were those diagnosed with nocturia, without cognitive or perceptual impairments, and who consented to participate.

Instruments

The data were collected using the structured information form, tracking and assessing nocturia to guide outcomes (TANGO) Nocturia Screening Tool, and the Short Form-36 Health Survey (SF-36).

Structured Information Form

The form, which was prepared in line with the literature, consists of ten questions to collect information about the following characteristics of the participants: age, gender, marital status, presence of a chronic disease, continuous drug use status, the amount of fluid taken daily, and the number of urinations at night.[4,5]

TANGO Nocturia Screening Tool

The TANGO tool, developed by Bower et al.[10] and adapted into Turkish by Culha et al.,[5] was used to identify the potential and existing causes of nocturia. TANGO is a checklist-based tool consisting of 22 items across four domains: Cardiovascular-metabolic status, sleep, urinary tract, and well-being. Each item is scored as "true" (1 point) or "false" (0 points). Domain scores are calculated by summing "true" responses and dividing by the total number of items in the domain, with the highest scoring domain identified as the likely cause of nocturia. The Turkish version of the tool demonstrated a Cronbach's alpha of 0.73, while in this study, it was found to be 0.81.[5, 10]

SF-36, created by Ware and Sherbourne[11] and adapted into Turkish by Koçyiğit et al.,[12] is used to evaluate QoL. The scale consists of 36 items under eight sub-dimensions (physical functioning, role-physical, social functioning, role-emotional, mental health, vitality, bodily pain, and general health). The total scale score ranges between 0 and 100 points and higher scores indicate a better level of health. In the Turkish validation, the Cronbach's alpha for the sub-dimensions was reported between 0.73 and 0.76, reflecting reliable internal consistency.

Ethical Considerations

Data collection began after receiving ethics committee approval from the institution where the research was conducted (Approval Number: 2021/378). Written consent was obtained from all participants. The study was conducted in accordance with the Declaration of Helsinki.

Data Analysis

Data were analyzed using SPSS 25.0 statistical software for Windows (IBM, USA).[13] The Kolmogorov–Smirnov test was applied to determine whether continuous variables followed a normal distribution. The Kruskal–Wallis test was employed to compare demographic data across different etiological factors. A significance level of $p<0.05$ was applied.

RESULTS

The analysis of the individual characteristics revealed that 57.8% of the participants were male; their mean age was 68.95±4.02; 67.6% were married, and 53.9% had a chronic disease. It was revealed that the average daily fluid intake of the patients was 1906.86±801.39 L, and the average number of urinations at night was 3.77±1.33 (Table 1).

The findings obtained from the TANGO Nocturia Screening Tool are displayed in Table 2. The analysis of the etiological factors of nocturia according to the TANGO screening tool revealed that the cardiovascular-metabolic factors were prevalent in 22 (21.56%) participants. The prevalence of other fac-

Table 1. Characteristics of the patients (n=102)

Characteristics	Mean	SD	Minimum	Maximum	n	%
Age	68.95	4.02	65	79		
Height (cm)	165.14	8.88	150	185		
Weight (kg)	80.87	12.29	48	100		
The amount of fluid taken per day	1906.86	801.39	1000	4000		
Nocturia (times/d)	3.77	1.33	2	6		
Gender						
Female					43	42.2
Male					59	57.8
Marital status						
Married					69	67.6
Single					33	32.4
Educational level						
Not literate					10	9.8
Primary school					29	28.4
High school					40	39.2
University					23	22.5
Chronic disease						
Yes					55	53.9
No					47	46.1

tors can be listed as follows: Sleep in 26 (25.49%) participants, urinary tract in 34 (33.33%) participants, and well-being in 20 (19.61%) participants (Supplementary Fig. 1).

The mean scores of the participants on the SF-36 Health Survey sub-dimensions are as follows: Physical functioning 53.63±33.49, bodily pain 50.78±28.69, role-physical 37.50±38.34, role-emotional 58.50±34.29, mental health 56.61±18.49, social functioning 57.72±62.50, vitality 52.99±18.86, and general health 44.12±17.92 (Table 3).

Evaluation between the frequency of nocturia episodes and patients' QoL revealed a negative and statistically significant association. Higher numbers of nocturia episodes correlated with lower mean scores in physical functioning (p=0.001), bodily pain (p=0.000), and role-physical (p=0.000) dimensions of QoL (Table 4).

There was a negative relationship between TANGO cardiovascular-metabolic status domain and the mean scores for the bodily pain (p=0.000), role-physical (p=0.004), role-emotional (p=0.008), social functioning (p=0.000), and vitality (p=0.003) sub-dimensions of the SF-36 Health Survey (Table 4).

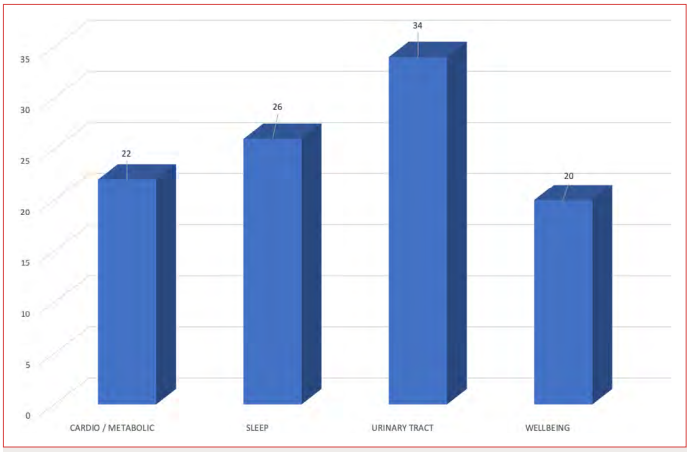

Figure 1. Distribution of etiological factors of nocturia by tracking and assessing nocturia to guide outcomes nocturia screening tool (n=102).

There was a significant relationship which was found between TANGO sleep domain and the mean scores for the sub-dimensions of bodily pain (p=0.002), role-emotional (p=0.011), social functioning (p=0.005), and vitality (p=0.000) in the SF-36 Health Survey (Table 4).

Table 2. Distribution of patients' responses to TANGO (n=102)

	STATEMENT	Yes, n (%)	No, n (%)
CARDIO/METABOLIC	1- My ankles, feet or legs swell during the day.	35 (34.3)	67 (65.7)
	2- I take fluid tablets (e.g. Lasix).	18 (17.6)	84 (82.4)
	3- I have kidney disease.	21 (20.6)	81 (79.4)
	4-I take tablets to control my blood pressure.	13 (12.7)	89 (87.3)
	5- I often get dizzy when standing up.	26 (25.5)	76 (74.5)
	6- I have high blood sugar OR diabetes.	16 (15.7)	86 (84.3)
	7- My blood sugar levels are difficult to keep stable.	5 (4.9)	97 (95.1)
SLEEP	1- I have 5 hours or less sleep per night.	46 (45.1)	56 (54.9)
	2- I would describe my sleep quality as bad.	41 (40.2)	61 (59.8)
	3- It takes me longer than 30 minutes to fall asleep at night.	33 (32.4)	69 (67.6)
	4- I have difficulty staying asleep at night because of my bladder.	39 (38.2)	63 (61.8)
	5- I often experience pain at night.	20 (19.6)	82 (61.8)
	6- I have been told I snore loudly OR stop breathing at night.	46 (45.1)	56 (54.9)
URINARY TRACT	1- I need to get up to pass urine within 3 hours of going to sleep.	84 (82.4)	18 (17.6)
	2- I experience a sudden urge to urinate on most days.	78 (76.5)	24 (23.5)
	3- I have a bladder urgency accident once a week or more.	60 (58.8)	42 (41.2)
	4- I often need to strain or push to start urinating.	31 (30.4)	71 (69.6)
	5- I have an enlarged prostate gland.(MALES ONLY)	26 (25.5)	76 (74.5)
WELLBEING	1- In general, I would say that my health is not good.	55 (53.9)	47 (46.1)
	2- I have trouble staying awake while driving, eating or during social activities.	10 (9.8)	92 (90.2)
	3- I have had a fall in the last 3 months.	31 (30.4)	71 (69.6)
	4- I don't look forward to things with as much enjoyment as I used to.	54 (52.9)	48 (47.1)

TANGO: Tracking and Assessing Nocturia to Guide Outcomes.

Table 3. Subscales Scores of The 36-Item Short Form Health Survey questionnaire of the Patients (n=102)

Subscales	Mean	SD	Min	Max
Physical functioning	53.63	33.49	0	100
Pain	50.78	28.69	2.5	100
Role limitations due to physical health	37.50	38.34	0	100
Role limitations due to emotional problems	58.50	34.29	0	100
Emotional well-being	56.51	18.49	16	88
Social functioning	57.72	62.50	12.5	87.5
Energy/fatigue	52.99	18.86	15	80
General health	44.12	17.92	5	70

A positive relationship between TANGO urinary tract domain and the mean scores for the SF-36 Health Survey sub-dimensions of physical functioning (p=0.001) and role-physical (p=0.012). In addition, a negative and statistically significant relationship was found between the urinary tract domain and the SF-36 sub-dimension of vitality (p=0.001) (Table 4).

Another finding is that a negative and statistically significant relationship was found between TANGO well-being domain and the SF-36 Health survey sub-dimensions of bodily pain (0.004), role-emotional (p=0.000), social functioning (p=0.001), and vitality (p=0.000) (Table 4).

DISCUSSION

It was found that among the etiologies of nocturia, urinary tract (33.33%) was the prior etiological condition, followed by sleep (25.49%), cardiovascular-metabolic status (21.56%), and well-being (19.61%). The items under the urinary tract domain

Table 4. The relationship between nocturia etiology and quality of life in patients (n=102)

Nocturia times and TANGO etiology factors	Physical Functioning	Pain	Role Limitations Due To Physical Health	Role Limitations Due To Emotional Problems	Social Functioning	Energy/ Fatigue	General Health	Emotional Well-Being
Nocturia (Times/d)								
r	-,327**	-,468**	-,494**	-0,106	-0,129	-0,099	-0,179	-0,112
p	0,001	0,000	0,000	0,288	0,198	0,320	0,072	0,264
TANGO Cardıo/Metabolic								
r	-0,150	-,351**	-,280**	-,260**	-,558**	-,295**	-0,173	-0,056
p	0,133	0,000	0,004	0,008	0,000	0,003	0,083	0,576
TANGO Sleep								
r	-0,023	-,307**	-0,163	-,251*	-,274**	-,422**	-0,063	0,019
p	0,815	0,002	0,101	0,011	0,005	0,000	0,530	0,849
TANGO Urinary Tract								
r	,317**	0,034	,247*	-0,149	0,018	-,311**	0,085	0,093
p	0,001	0,738	0,012	0,136	0,858	0,001	0,395	0,355
TANGO Wellbeing								
r	0,039	-,281**	-0,179	-,340**	-,318**	-,392**	-0,093	0,058
p	0,698	0,004	0,071	0,000	0,001	0,000	0,350	0,566

*Pearson Correlation test was used; TANGO: Tracking and Assessing Nocturia to Guide Outcomes.

in the TANGO Nocturia Screening Tool express the presence of voiding disorders and the frequency of nocturia due to the enlargement of the prostate, which is frequently seen in elderly men with overactive bladder.[5,10] It is highlighted in the literature that bladder storage problems; decrease in maximum urine flow rate, ability to delay urination, and kidney functions; increase in post-void residual volume; and age-related changes in detrusor muscle activity cause nocturia.[3,5,14]

The analysis of QoL among participants with nocturia revealed that the highest mean score was observed in the role-emotional sub-dimension, which reflects limitations due to emotional problems (58.50±34.29), while the lowest mean score was in the role-physical sub-dimension, which refers to limitations caused by physical problems (37.50±38.34). The total scores on the SF-36 Health Survey range from 0 to 100. The findings indicated that all sub-dimensions, except for role-physical and general health, had mean scores above average. This suggests that the overall QoL for participants was moderate, with role-physical being the most negatively impacted dimension, highlighting limitations in performing physical activities, including self-care tasks.

The literature underscores that nocturia significantly reduces individuals' QoL, with the physical functioning dimension being particularly affected due to the adverse impact of poor sleep quality associated with nocturia.[1,8,15,16]

A study examining the link between the frequency of nocturia episodes and participants' QoL found a negative and statistically significant association with the mean scores in the SF-36 Health Survey sub-dimensions of physical functioning, bodily pain, and role-physical. This result suggests that an increase in nocturia episodes among elderly individuals leads to a decline in QoL in these specific areas. In addition, the connection between nocturia and insomnia is widely recognized in existing research.[3] Sleep is essential for overall well-being, but its restorative function diminishes, particularly with aging, often leading to more frequent awakenings. In older adults, nocturia, along with the aging process itself, is a primary contributor to sleep disturbances. The resulting sleep deprivation from frequent nighttime awakenings can adversely impact overall health and well-being.[8] It is reported in the literature that poor sleep quality may have a negative impact on physical and mental functions as well as activities of daily living, which may lead to deterioration in QoL.[7,17,18] Studies which investigated the effect of nocturia and sleep disturbance on QoL found that nocturia is an independent risk factor for the physical component of QoL.[1,15]

A negative and statistically significant relationship was found between the TANGO cardiovascular-metabolic status domain and the mean scores of the participants for the sub-dimensions of bodily pain, role-physical, role-emotional, social functioning, and vitality. The items under the TANGO cardiovascular-metabolic status domain refer to disorders that contribute to nocturnal polyuria (peripheral edema, hypertension, kidney diseases, diabetes, etc.).[5,10] In this context, this finding indicates that as the cardiovascular-metabolic factors increase, the QoL associated with these areas is negatively affected. The low mean scores for the sub-dimensions of bodily pain, role-physical, and vitality may be attributed to biological changes in the physical dimensions of elderly individuals.[19] In cardiovascular diseases, peripheral edema may occur due to changes in salt and water retention, and the increase in the load on the heart causes an increase in urine production in the kidneys. This situation brings about nocturia and nocturnal polyuria, resulting in poor sleep quality.[20] After the onset of a cardiovascular disease, a decrease in physical activity and problems with the ability to physically perform daily routines such as self-care are to be expected.[21]

The study revealed a positive and statistically significant relationship between the TANGO urinary tract etiological factor and the mean scores for the SF-36 Health Survey sub-dimensions of physical functioning and role-physical. In addition, the study found a negative and statistically significant relationship between the TANGO urinary tract etiological factor and the mean score for the sub-dimension of vitality. Overactive bladder, incontinence, or the increase in voiding disorders due to the enlargement of the prostate in male patients can negatively affect the physical functioning dimension of QoL. Decreased bladder capacity, increased postvoid residual volume, overactivity of the detrusor muscle, and weak pelvic floor muscles are responsible for the development of both nocturia and urge incontinence, especially in older women. Decreased physical performance and weakness in older individuals have been strongly associated with the possibility of incontinence in the literature. The decrease in physical performance is associated with an increased risk of falling and hinders the elderly individual's ability to perform toilet activities.[22-24]

A negative and statistically significant relationship was found between the TANGO well-being etiological factor and the mean scores for the SF-36 Health Survey sub-dimensions of bodily pain, role-emotional, social functioning, and vitality. Health status, daytime sleepiness, and history of falls define the well-being domain of the TANGO. Nocturia is known to cause sleep disruption, fatigue, and impairment in performing activities of daily living. Especially fatigue due to poor sleep quality and daytime sleepiness are very important risk factors for accidents such as falls in elderly individuals.[3,10]

Previous studies reported that nocturia affects the physical and social functions of patients and causes a deterioration in general well-being. It has also been emphasized in the literature that the relationship between low walking speed and decrease in activities of daily living in elderly individuals can be evaluated as the consequence of the negative effect of nocturia on physical functioning and well-being.[3,7,25]

CONCLUSION

The study identified the urinary tract as the most prominent etiological factor contributing to nocturia in elderly individuals, as determined by the TANGO screening tool. It also highlighted that participants generally experienced a moderate QoL, with role-physical being the most affected dimension. To enhance care, improve QoL, and mitigate nocturia-related chronic conditions, healthcare professionals should thoroughly assess nocturia and its underlying causes as part of a comprehensive geriatric evaluation. Strategies to address and manage nocturia and its root causes should be carefully planned and implemented.

DECLARATIONS

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Ethics Committee Approval: The study was approved by Istanbul Prof. Dr. Cemil Taşçıoğlu City Hospital Ethics Committee (No: 2021/378, Date: 08/11/2021).

Author Contributions: Concept – Y.Ç.; Design – E.E., S.E.M.; Supervision – M.G.Ç.; Materials – Y.Ç., M.G.Ç.; Data collection &/or processing – E.E.; Analysis and/or interpretation – M.G.Ç., S.E.M.; Literature search – Y.Ç., E.E.; Writing – Y.Ç., E.E.; Critical review – M.G.Ç.

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