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RESEARCH ARTICLE

Quality of Life in Patients with Non-Muscle Invasive Bladder Cancer

Jelena Ikadinović [1], Andrijana Ćorić [1], Vladimir Poznan [1], Mladen Popov [1,2]

[1] Faculty of Medicine, University of Novi Sad, Novi Sad, Republic of Serbia

[2] Department of Urology, University Clinical Center of Vojvodina, Novi Sad, Republic of Serbia

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Corresponding Author;
Andrijana Ćorić
Address: Faculty of Medicine, University of Novi Sad, Hajduk Veljkova 3, 21000 Novi Sad, Republic of Serbia
E-mail: 912007d23@mf.uns.ac.rs

ORCID
J.I. 0009-0007-9649-7830
A.C. 0009-0004-2094-265X
V.P. 0009-0006-1447-4161
M.P. 0000-0003-0437-2170

Abstract

Objective: Because non-muscle invasive bladder cancer (NMIBC) is characterized by frequent recurrence and intensive surveillance, patients may experience a substantial burden affecting their quality of life. Therefore, this study aimed to assess health-related quality of life and identify sociodemographic and clinical factors associated with quality of life in patients with NMIBC.

Methods: A cross-sectional observational study was conducted at the Urology Clinic of the University Clinical Center of Vojvodina. Health-related quality of life was assessed using the EORTC QLQ-C30 questionnaire. Sociodemographic variables (age and sex) and clinical characteristics (histopathological stage, BCG therapy, number of TUR procedures, number of cystoscopies, and follow-up duration) were analyzed to identify factors associated with quality of life.

Results: The mean general health status was 58.89/100, with the highest functioning observed in the physical and social domains, while role functioning was the lowest. The most common symptoms were fatigue, insomnia, and pain, whereas dyspnea, diarrhea, and nausea were the least reported. Women had better physical functioning than men ($p = 0.033$), while men more frequently reported insomnia ($p = 0.037$) and appetite loss ($p = 0.007$). Older patients had lower general health status and physical functioning ($p < 0.01$).

Conclusion: Patients demonstrated a moderate quality of life, with the highest scores in physical and social functioning, while the lowest scores were observed in role functioning. Older age and male sex were associated with poorer quality of life.

Keywords: quality of life, non-muscle invasive bladder cancer, urology

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INTRODUCTION

Quality of life (QoL) refers to the mental, physical, and spiritual well-being of an individual and a population, considering the positive and negative factors that affect an individual or population over a period of time. The World Health Organization (WHO) defines quality of life as an individual's perception of their position in life in the context of the culture and value system in which they live, in relation to their goals, expectations, standards, and concerns (1). Quality of life is an important aspect of medical decision-making, as it is a predictor of treatment success and has significant prognostic importance. It is also a significant predictor of survival, suggesting the need for routine assessment in clinical settings (2, 3).

In addition to the therapeutic effects of different treatment modalities, clinicians prioritize the overall quality of life of the oncology patient, regardless of the stage of the disease, the method of treatment, and the expected survival of the patient (4). Patients' quality of life is assessed using standardized questionnaires. Although the EORTC QLQ-C30 questionnaire is widely used to assess the quality of life of cancer patients, it is not tumor-specific (5).

Urothelial carcinoma is the most commonly diagnosed malignancy of the bladder in clinical and histopathological practice. On the epidemiological scale of malignant diseases of the male sex, it occupies the second place, while the first place is prostate adenocarcinoma. It is significantly more commonly diagnosed in men, which is associated with differences in exposure to carcinogens between the sexes. It occurs mainly in people over 70 years of age (6).

Given the unchanged mortality rates in recent years, the socio-medical impact of bladder cancer in the future will depend primarily on the number of newly diagnosed cases (7).

Bladder cancer is predominantly non-muscle invasive (about 75%), i.e., limited to the mucosa or submucosa (8). The most common clinical manifestation of bladder cancer is the appearance of painless hematuria. In patients with bladder tumors, dysuria problems may be present (9).

In the absence of non-invasive methods for predicting and monitoring the course of the disease, the gold standard for monitoring patients after treatment is repeated cystoscopy combined with urine cytological examination, which results in a serious financial burden and reduced adherence to the recommended follow-up regimen among patients (10). Side effects of intravesical immunotherapy and patient stress due to repeated invasive diagnostic procedures can cause negative emotions in patients. It is believed that 20–30% of cancer patients suffer from depression, sleep disorders, low self-esteem, and mental health problems, while 23% of patients in the advanced stages of the disease experience loss of consciousness and hallucinations. Ignoring these emotions can cause a range of physical and mental symptoms, which inevitably affect treatment outcomes and quality of life (11).

Despite significant progress in treatment, patients still face a high risk of recurrence of bladder cancer, which is approximately 60% over a 5-year period (12).

The impact of non-muscle-invasive bladder cancer on patients' quality of life throughout diagnosis, treatment, and surveillance remains insufficiently understood (13). Furthermore, data from the Serbian population are lacking. Therefore, this study aimed to evaluate health-related quality of life and identify sociodemographic and clinical factors associated with it in patients with NMIBC.

MATERIALS AND METHODS

The observational, analytical, cross-sectional study was conducted at the Clinic of Urology, University Clinical Center of Vojvodina, from December 1, 2024, to March 1, 2025. The research has been approved by the Ethics Committee of the University Clinical Center of Vojvodina (Ethics Approval Number: 6/00–90, Date: February 14, 2025). Patient consent to participate in the study was obtained in accordance with the Helsinki Declaration.

The study was conducted by surveying patients during regular urological check-ups in the specialist polyclinic of the University Clinical Center of Vojvodina. Patients completed the questionnaire after the examination in a separate room to ensure privacy. Socio-demographics (gender, age, place of residence) as well as clinical parameters (histopathological findings, number of cystoscopies, application of BCG

therapy, number of TUR bladder biopsies, and length of follow-up of the patient) were analyzed, which were available within the Clinical Information System of the University Clinical Center of Vojvodina.

Patients were selected using the convenience sample method, which included the inclusion of all patients who met the inclusion criteria below and gave their written consent to participate in the study.

Criteria for the inclusion of patients in the study:

- Patients with a diagnosis of non-invasive urothelial bladder cancer (stages Ta, T1, or CIS - carcinoma in situ)
- Regular check-up with a urologist within the estimated duration of the study (1.12.2024 to 1.3.2025)
- Adequate ability to read, that is, to understand the content of the questionnaire by the patient
- Giving written consent to voluntarily participate in the research

Criteria for excluding patients from the study:

- Inability of the patient to give written consent from the patient
- Refusal of the patient to participate in the study

Research Instrument

For the purposes of this study, the official Serbian version of the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30, version 3.0) was obtained from the EORTC Quality of Life Group and used with their permission. No bladder cancer-specific quality-of-life questionnaire was administered.

The EORTC QLQ-C30 is designed to assess the quality of life of cancer patients. Version 3.0 of the questionnaire is standard and is recommended for use in all recent surveys. The instrument consists of a total of 30 items arranged in scales, in addition to which individual questions are included to assess the severity of symptoms. It consists of 5 functional scales (physical functioning, role functioning, cognitive functioning, emotional functioning, and social functioning), 3 symptom scales (fatigue, pain, nausea, and vomiting), general health/quality of life scales, and 6 individual questions. Scales contain different sets of questions, with each item appearing only within a single scale. The results of all scales and individual items are linearly converted to a range from 0 to 100. High scores on the global health status and functional scales indicate a high level of functionality, while low scores on the symptom scales mean a less intense experience of symptoms, which also indicates a better quality of life.

Items within the five domains are assessed on a 4-point Likert scale with the categories of not at all (1), little (2), quite a lot (3), and a lot (4). The Global Quality of Life Scale/QoL consists of two statements that are evaluated on a modified 7-point linear analogue scale (14,15).

The QLQ-C30 instrument demonstrates good reliability and validity in the assessment of health-related functional health, symptoms, and quality of life in patients with localized to advanced cancer (16).

The EORTC QLQ-C30 questionnaire requires official approval from the European Organization for Research and Treatment of Cancer. A completed form is available on the official website of EORTC, which includes all relevant information about the questionnaire, terms of use, and data protection.

Statistical Data Analysis

Statistical data processing was performed in IBM SPSS Statistics 29.0. Within descriptive statistics, absolute and relative frequencies for nominal and ordinal variables are calculated, as well as the arithmetic mean with standard deviation for continuous variables. The t-test and the $\chi 2$ test were used to calculate the differences, and the Pearson correlation was used to calculate the correlation. The p-value of < 0.05 was statistically significant.

RESULTS

Sociodemographic and Clinical Characteristics of Patients

The sample consisted of a total of 104 patients, i.e., 38 females and 66 males, aged 37 to 87 years. The mean age of all patients was 69.13 years, with a standard deviation of 9.39 years (male: 70.14, female: 67.37 years). There was no statistically significant difference in age between the sexes ($t = 1,456$, $p = 0.149$). There was no statistically significant difference in the place of residence of the patients ($\chi^2 = 2.46$, $p = 0.117$).

Table 1. Distribution of patients according to clinical parameters

Clinical Parameter	n (%)
Histopathological findings	
T0	73 (70.2)
T1	31 (29.8)
BCG therapy	
Yes	44 (42.3)
No	60 (57.7)
TUR bladder biopsy	
1	61 (58.7)
>1	43 (41.3)
Length of follow-up (years)	
<1	46 (44.2)
>1	58 (55.8)
	x̄ (SD)
Number of cystoscopies	3.52 (2.94)

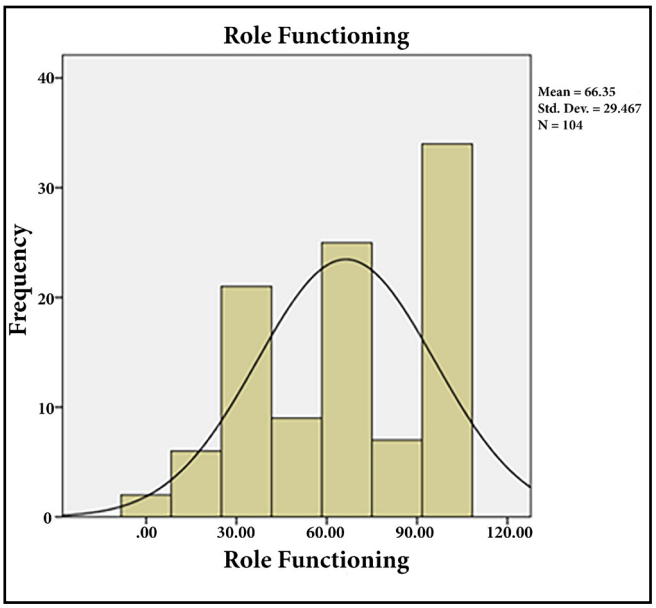

Figure 1. Distribution of the patient on the scale of functioning in life roles

Quality of Life for Patients with Non-Invasive Bladder Cancer

When it comes to the quality of life of patients with non-invasive bladder cancer, Table 2 shows the status of general health, and five scales of functioning (physical, role functioning, emotional, cognitive, and social). Analysis of the functioning scales revealed the highest levels of functioning in the physical and social domains, while role functioning demonstrated the lowest scores. This scale also showed the greatest variability among participants, with the distribution of responses suggesting the existence of several distinct response subgroups (Figure 1).

The histogram illustrates the distribution of scores for role functioning among participants (N = 104). The x-axis represents the role functioning scores, while the y-axis indicates the frequency of participants within each score range. A smooth curve representing the normal distribution is overlaid on the histogram. The mean score is 66.35 with a standard deviation of 29.47, indicating a moderate variability in role functioning across the sample.

Among the symptom scales, the highest mean scores were observed for fatigue (35.79 ± 24.08), insomnia (35.57 ± 31.25), and pain (30.44 ± 26.11), indicating that these were the most frequently reported and burdensome symptoms in the study population. Moderate symptom burden was observed for financial difficulties (21.15 ± 27.50), appetite loss (19.55 ± 26.11), and constipation (16.98 ± 29.00). In contrast, dyspnoea (8.01 ± 17.68), diarrhoea (11.85 ± 23.18), and nausea and vomiting (13.78 ± 23.27) had the lowest mean scores, suggesting that these symptoms were relatively uncommon among the participants.

The Relationship Between Sociodemographic Characteristics and the Quality of Life of Patients

Table 3 summarizes the associations between sex, age, and quality of life. Women had significantly better physical functioning than men, whereas men reported higher insomnia and appetite loss scores (all $p < 0.05$). Constipation was more pronounced in women ($p < 0.05$). Older age was associated with poorer global health status and physical functioning, as well as higher fatigue and appetite loss scores.

The Impact of Clinical Parameters on the Quality of Life of Patients

Differences between patients based on clinical parameters, such as histopathological findings, were examined by a series of t-tests for independent samples. A statistically significantly higher score on all examined scales was shown by patients with histopathological findings of Ta, compared with T1.

Significant differences were observed for all symptom scales except diarrhea and financial difficulties (Table 4).

A series of t-tests was also used to examine the differences between patients who underwent BCG therapy and those who did not in relation to their general health status, functioning, and symptoms. Detailed results are given in Table 5.

Determining the difference between patients who had one or more TUR bladder biopsies in relation to quality of life was examined by T tests for independent samples. The results presented in Table 6 show that there are no statistically significant differences between the examined groups on any dimension.

No statistically significant differences in quality of life were observed according to the duration of follow-up (all $p > 0.05$). Similarly, the number of cystoscopies was not associated with global health status or most functional and symptom scales. Weak positive correlations were found with physical functioning ($r = 0.215$, $p < 0.05$) and emotional functioning ($r = 0.205$, $p < 0.05$), whereas appetite loss was weakly negatively correlated with the number of cystoscopies ($r = -0.269$, $p < 0.05$).

Table 2. Descriptive statistics on the status of general health and the scale of functioning

	$\bar{x}$	SD	*Skewness* (SE)		*Kurtosis* (SE)	
Global Health Status/QoL	58.89	20.65096	0.140	(0.237)	-0.625	(0.469)
Functional scales						
Physical functioning	74.16	21.21	-0.682	(0.237)	-0.458	(0.469)
Role functioning	66.34	29.46	-0.303	(0.237)	-1,109	(0.469)
Emotional functioning	68.34	23.29	-0.843	(0.237)	0.750	(0.469)
Cognitive functioning	70.83	25.30	-0.604	(0.237)	-0.565	(0.469)
Social functioning	73.71	28.22	-0.825	(0.237)	-0.243	(0.469)

Table 3. Association of sex and age with quality of life in patients with non-muscle invasive bladder cancer

Scale	Men (n = 66) Mean ± SD	Women (n = 38) Mean ± SD	*p*	Age (r)
Global Health Status/QoL	57.07 ± 21.98	62.06 ± 17.93	0.237	-0.263**
Functional scales				
Physical functioning	70.80 ± 22.57	80.00 ± 17.39	0.033*	-0.287**
Role functioning	62.87 ± 29.35	72.36 ± 29.06	0.114	-0.167
Emotional functioning	65.27 ± 24.31	73.68 ± 20.64	0.076	-0.122
Cognitive functioning	68.93 ± 25.63	74.12 ± 24.71	0.317	-0.117
Social functioning	69.94 ± 30.97	80.26 ± 21.52	0.073	-0.028
Symptom scales/items				
Fatigue	38.38 ± 26.52	31.28 ± 18.60	0.149	0.198*
Nausea and vomiting	16.66 ± 26.14	8.77 ± 16.31	0.096	-0.021
Pain	31.56 ± 27.13	28.50 ± 24.47	0.568	0.155
Dyspnoea	9.09 ± 18.98	6.14 ± 15.21	0.415	0.101
Insomnia	40.40 ± 30.67	27.19 ± 30.85	0.037*	-0.012
Appetite loss	24.74 ± 28.23	10.52 ± 19.14	0.007*	0.245*
Constipation	12.12 ± 24.55	25.43 ± 34.16	0.023*	-0.123
Diarrhoea	12.62 ± 23.21	10.52 ± 23.38	0.659	-0.019
Financial difficulties	24.74 ± 29.99	14.91 ± 21.50	0.079	0.036

Notes: Data are presented as mean ± standard deviation (SD). Differences between sexes were analyzed using the independent samples t-test. Age was analyzed using Pearson's correlation coefficient (r). $p < 0.05$ was considered statistically significant. $p < 0.05$*, *$p < 0.01$.

Table 4. Differences between patients with Ta and T1 PH findings in relation to quality of life

	Histopathological findings	n	x̄	SD	t-test	p
Global Health Status/QoL	Ta	73	63.58	19.56	3,776	< 0.001*
	T1	31	47.84	19.12		
Functional scales						
Physical functioning	Ta	73	81.09	17.17	-4,549	< 0.001*
	T1	31	57.84	21.10		
Role functioning	Ta	73	73.74	26.77	-2,580	0.011
	T1	31	48.92	28.52		
Emotional functioning	Ta	73	76.02	17.67	-4,354	< 0.001*
	T1	31	50.26	25.13		
Cognitive functioning	Ta	73	78.53	19.53	-2,287	0.024*
	T1	31	52.68	28.25		
Social functioning	Ta	73	79.45	25.53	-4,163	< 0.001*
	T1	31	60.21	30.02		
Symptom scales/items						
Fatigue	Ta	73	29.37	20.56	-4,549	< 0.001*
	T1	31	50.89	25.30		
Nausea and vomiting	Ta	73	10.04	20.17	-2,580	0.011*
	T1	31	22.58	27.73		
Pain	Ta	73	23.74	22.20	-4,354	< 0.001*
	T1	31	46.23	28.12		
Dyspnoea	Ta	73	5.47	14.71	-2,287	0.024*
	T1	31	13.97	22.40		
Insomnia	Ta	73	27.85	28.87	-4,163	< 0.001*
	T1	31	53.76	29.41		
Appetite loss	Ta	73	11.87	19.53	-5,138	< 0.001*
	T1	31	37.63	30.72		
Constipation	Ta	73	11.87	23.15	-2,854	0.005*
	T1	31	29.03	37.25		
Diarrhoea	Ta	73	9.13	19.45	-1,862	0.065
	T1	31	18.27	29.61		
Financial difficulties	Ta	73	19.63	27.12	-0.863	0.390
	T1	31	24.73	28.50		

*Statistically significant difference.

Table 5. Differences between patients who received BCG therapy in relation to quality of life

	BCG therapy	n	x̄	SD	t-test	p
Global Health Status/QoL	Yes	44	61.55	22.74	1,126	0.263
	No	60	56.94	18.92		
Scale of operation						
Physical functioning	Yes	44	76.81	19.20	1,092	0.277
	No	60	72.22	22.53		

Table 5 Contuniued. Differences between patients who received BCG therapy in relation to quality of life

Role functioning	Yes	44	66.66	29.85	0.095	0.925
	No	60	66.11	29.42		
Emotional functioning	Yes	44	71.59	24.13	1,218	0.226
	No	60	65.97	22.56		
Cognitive functioning	Yes	44	73.86	24.48	1,046	0.298
	No	60	68.61	25.87		
Social functioning	Yes	44	75.00	23.97	0.395	0.694
	No	60	72.77	31.13		
Symptom scales/items						
Fatigue	Yes	44	31.81	21.10	-1,448	0.151
	No	60	38.70	25.83		
Nausea and vomiting	Yes	44	12.12	19.47	-0.621	0.536
	No	60	15.00	25.80		
Pain	Yes	44	28.78	25.25	-0.554	0.581
	No	60	31.66	26.87		
Dyspnoea	Yes	44	9.09	16.64	0.531	0.597
	No	60	7.22	18.50		
Insomnia	Yes	44	34.09	31.73	-0.414	0.680
	No	60	36.66	31.11		
Appetite loss	Yes	44	14.39	19.55	-1,742	0.085
	No	60	23.33	29.62		
Constipation	Yes	44	21.96	34.43	1,509	0.134
	No	60	13.33	23.92		
Diarrhoea	Yes	44	12.87	22.97	0.383	0.703
	No	60	11.11	23.50		
Financial difficulties	Yes	44	15.15	19.62	-1.931	0.056
	No	60	25.55	31.51		

Table 6. Differences between patients who have had one or more TUR biopsies in relation to quality of life

	TUR biopsy	**n**	**x̄**	**SD**	**t-test**	**p**
Global Health Status/QoL	1	61	59.69	20.53	0.472	0.638
	>1	43	57.75	21,001		
Functional scales						
Physical functioning	1	61	73.33	22.57	-0.475	0.636
	>1	43	75.34	19.32		
Role functioning	1	61	66.12	30.72	-0.093	0.926
	>1	43	66.66	27.93		
Emotional functioning	1	61	68.71	22.65	0.190	0.850
	>1	43	67.82	24.43		
Cognitive functioning	1	61	71.85	25.37	0.490	0.625
	>1	43	69.37	25.44		
Social functioning	1	61	76.22	27.63	1,082	0.282
	>1	43	70.15	28.99		

Table 6 Contuniued. Differences between patients who have had one or more TUR biopsies in relation to quality of life

Symptom scales/items						
Fatigue	1	61	36.79	25.62	0.504	0.615
	>1	43	34.36	21.93		
Nausea and vomiting	1	61	14.20	26.32	0.221	0.825
	>1	43	13.17	18.38		
Pain	1	61	31.96	26.57	0.705	0.483
	>1	43	28.29	25.59		
Dyspnoea	1	61	7.10	18.37	-0.622	0.535
	>1	43	9.30	16.78		
Insomnia	1	61	36.61	30.85	0.401	0.689
	>1	43	34.10	32.11		
Appetite loss	1	61	22.40	27.02	1,332	0.186
	>1	43	15.50	24.50		
Constipation	1	61	15.84	24.80	-0.476	0.635
	>1	43	18.60	34.35		
Diarrhoea	1	61	11.47	21.84	-0.200	0.842
	>1	43	12.40	25.22		
Financial difficulties	1	61	21.31	29.20	0.069	0.945
	>1	43	20.93	25.22		

DISCUSSION

The treatment of many cancers has advanced significantly in recent years, allowing patients to have better therapeutic options, primarily hormonal treatments and advanced diagnostic methods, instead of the invasive surgical procedures that were previously considered the standard. Despite these advancements, bladder cancer has not received the attention it deserves in terms of treatment options and quality of care. The treatment of bladder cancer poses significant economic challenges due to the necessity for frequent therapies and ongoing monitoring. This situation creates a considerable burden not only for healthcare systems but also for patients. These patients often strive to maintain their daily activities without interruption while preserving a high quality of life (17).

Adequate treatment choices and continuous support throughout the treatment process are imperative to improving the quality of life of patients with bladder cancer. Due to the large number of patients that the urologist treats on a daily basis, the registered nurse in the urology cabinet further clarifies and explains the diagnostic procedures to patients on a daily basis and gives useful instructions to patients who have bladder cancer, which makes their everyday life easier during the implementation of periodic urethroscopic examinations and the administration of intravesical immunotherapy BCG.

A positive relationship between the registered nurse and the patient reduces the length of hospital treatment, improves the quality of health services provided, and has a very positive effect on the satisfaction of both parties (18).

The results of Jung et al.'s study (19) showed that the average general health status of patients with non-invasive bladder muscle cancer is 73.6/100, while the results of Catto et al. (20) are slightly lower at 71/100, and our results indicate that the average general health status is 58.89/100. Despite having a mean age of 69 years, patients in our study reported a lower global health status than patients in other studies, whose mean age was similar to or even higher than that of our study population.

In the context of the influence of sociodemographic factors (gender, age) on the quality of life, Beeren et al. (21) found that women have reduced physical functioning compared

with men, as shown by a study by Jung et al. (19). The results of these studies state that women reported problems such as constipation, diarrhea, fatigue, pain, and insomnia in a higher percentage. In our research, we also found the same results. In women, postmenopausal hormonal changes are associated with various physiological alterations, including urogenital symptoms, musculoskeletal changes, cardiovascular alterations, and psychological symptoms such as mood swings. These symptoms develop more rapidly in menopausal women who have undergone some surgical intervention compared with women in whom this process takes place over a long time and completely spontaneously (22). The reason for these results is most likely due to postmenopausal changes, the effects of which are primarily associated with estrogen deficiency (vasomotor symptoms, urogenital atrophy, osteoporosis, cardiovascular disease, decreased cognitive function, and sexual dysfunction).

Regarding the histopathological findings of tumors, Jung et al. (19) showed that patients with Ta findings have the best physical and social functioning with less frequent occurrence of fatigue and dyspnea, while patients with T1 have significantly worse results in the domain of physical and social functioning, with more frequent occurrence of fatigue, dyspnea, and financial difficulties. Furthermore, patients with histopathological findings of T1 who underwent intravesical therapy with BCG reported experiencing more significant issues compared with those with the same findings who did not receive this type of therapy.

In our study, we found results that support that patients with Ta had higher scores on the general health scale, as well as the functionality scale. When it comes to the symptom scale, there were differences within all symptoms, except diarrhea and financial difficulties. On all scales, patients with T1 score higher than those with Ta. The observed difference can be explained by the more intensive use of BCG therapy in cases of more extensive invasion of the malignant neoplasm, which is typical of T1 tumors. Additionally, these patients are more likely to come for follow-up cystoscopy, which further leads to irritation of the already damaged urothelium.

Regarding the length of follow-up, Catto et al. (20) found that there was a slight difference in scores for each questionnaire used, and Jung et al. (19) found that the only association observed was in the area of sexual functioning, which improved in the period since diagnosis. In our study, we found no statistically significant differences between the length of patient follow-up and their quality of life. Given that these parameters are observed continuously, this result can be explained by the limitation in terms of the duration of the research in a 3-month period.

It is significant to mention some other limitations of this research. Because the study was a cross-sectional study, baseline quality-of-life data before treatment were unavailable. Therefore, changes in quality of life over time or treatment-related trajectories could not be assessed. Our findings should be interpreted as a snapshot of health-related quality of life during routine follow-up.

There is a possibility that some patients, when self-assessing their quality of life, were biased, less precise, upset about the examination by the urologist that preceded the completion of the questionnaire, or gave socially desirable answers to certain questions. Furthermore, no bladder cancer-specific quality-of-life questionnaire was administered. Acute medical conditions or comorbidities not included in the study may affect patients' quality of life. It is necessary to conduct more thorough research, including the impact of an individualized approach to each patient with bladder cancer, as well as other urological diseases, on the quality of life. In clinical and outpatient settings, this approach should be continuously implemented, with a focus on age and gender differences between patients.

CONCLUSION

Our research indicated that,

- Patients with non-invasive bladder cancer have a moderate level of quality of life, with the best results within the domain of physical and social functioning.
- Male patients, as well as those of older age, have a lower level of quality of life.
- Histopathological findings significantly affect the quality of life, since patients with Ta findings had better results compared with those with T1 findings. In the context of other clinical parameters (BCG therapy, the number of TUR biopsies, and the number of cystoscopies), there is no significant impact on the patient's quality of life.
- The length of follow-up is not significantly related to

the level of quality of life, although patients who are followed for a longer period of time show slightly better results in emotional and cognitive functioning.

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Conflict of Interest: The authors declare no conflict of interest.

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Ethical Approval: The research has been approved by the Ethics Committee of the University Clinical Center of Vojvodina in Novi Sad (Ethics Approval Number: 6/00–90, Date: February 14, 2025).

Informed Consent: Patient consent to participate in the study was obtained in accordance with the Helsinki Declaration.

Author Contribution: JI and AĆ contributed to the conception and idea of the research paper and also the study design and data acquisition. AĆ, VP and MP contributed to the data analysis and interpretation. All authors contributed to the preparation of the paper and gave their approval for the version that was submitted.

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