

# The Effect of Cystoscopy on Patient Anxiety and Pain Scores: Comparison of Two Groups with and without Appointment

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## ABSTRACT

**Objective:** To investigate whether there is a difference between the groups with and without an appointment by measuring pain and anxiety scores before and after cystoscopy.

**Materials and Methods:** Between January and December 2013, 109 patients were randomized into two groups: same-day cystoscopy or scheduled cystoscopy. Pain and anxiety scores were recorded before and after the procedure to compare the effect of scheduling on pain and anxiety.

**Results:** Of the patients, the mean age was 50±14. Of these patients 26 patients were female and 83 patients were male. Fifty-five patients constituted the group with an appointment, while the remaining 54 patients were in the group without an appointment. Among the patients median age of the group without an appointment was 54±15 and 46±13 for the group with appointment. Median age was higher in the group without an appointment ( $p=0.006$ ). No gender difference was observed between the groups. Visual Analogue Scale (VAS) scores measured after the procedure were significantly higher in the group with appointment ( $p=0.014$ ). Also, no statistically significant difference was found between two groups in the State and Trait Anxiety Inventory (STAI) [both State Anxiety (STAI-SA) and Trait Anxiety (STAI-TA)] and Beck Anxiety Inventory (BAI).

**Conclusion:** Although the change in anxiety scores was not significant in the group given an appointment compared to the group not given an appointment, pain scores increased. In order to reduce the pain levels of the patients, it would be an appropriate approach to plan cystoscopy as soon as possible after the indication.

**Keywords:** Anxiety, local cystoscopy, pain

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## INTRODUCTION

Office-based cystoscopy is an outpatient procedure and a crucial diagnostic tool in urology. It is primarily used for diagnosing hematuria and lower urinary tract symptoms. Additionally, it is considered the gold standard for detecting bladder cancer and monitoring its progression. There are two types of cystoscope: one rigid type is more invasive and discomfort and the other type is flexible.<sup>[1]</sup> The office-based procedure provides a quick, simple, economical and safe examination for patients.

Psychological conditions such as anxiety and depression can greatly affect a patient's quality of life and overall well-being, potentially complicating invasive medical procedures. Office-based cystoscopy, being an invasive procedure itself, can similarly be linked to discomfort, as well as heightened feelings of anxiety and depression. This situation leads to increased patients' discomfort. Especially rigid type of cystoscope can lead to this discomfort.

Various techniques, including the use of lidocaine gel beforehand, listening to music, and watching a video monitor, have



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been explored and implemented in clinical settings to alleviate pain and discomfort.<sup>[2-4]</sup> However, despite these approaches, cystourethroscopy remains a procedure that causes some degree of pain and anxiety for patients. The discomfort and anxiety felt during the initial cystoscopy session can lead patients to decline future follow-up cystoscopies, which are essential for the treatment and ongoing monitoring of bladder cancer.

Due to the high daily patient volume in the clinic, some cystoscopy procedures were performed on the day of the initial appointment, while others were scheduled for later days due to department overcrowding. As far as we know, there are only a few studies that have examined the impact of this situation on patients' pain perception, depression, and anxiety levels. To fill this knowledge gap, we designed this study to assess whether immediate cystoscopy offers a significant advantage over planned procedures in terms of pain, depression, and anxiety.

## MATERIALS and METHODS

### Study Population

In this study, 109 patients were prospectively randomized to undergo office-based rigid cystoscopy performed by the same urologist between January and December 2013. The study included patients who were undergoing cystoscopy for the first time due to hematuria, for the evaluation of bladder cancer. All patients participating in the study had normal urinalysis results prior to the cystoscopy and showed no signs or symptoms of a urinary tract infection. The exclusion criteria included patients under 18 years of age, those with acute urinary tract infections, the presence of indwelling catheters prior to cystoscopy, a history of prostatectomy, any form of invasive intervention (such as cold biopsy, ureteral stent removal), and any history of psychiatric diagnosis.

This study was conducted in compliance with the Declaration of Helsinki. All participants were thoroughly informed and provided written consent. The study received approval from the Local Ethics Committee of İstanbul Training and Research Hospital (approval number: 2012-57).

### Cystoscopy Procedure

One hundred and nine patients were randomized into 2 groups according to application order by odd-even numbers. In group 1 (55 patients), immediate cystoscopy was undergone on the same day of application while others (54 patients) in group 2 were scheduled on the seventh day of their application. All procedures were carried out by a single urology specialist in a designated, private cystoscopy room. Prior to the procedure, all patients were given detailed information by the specialist who would perform the cystoscopy. The patient was positioned

in the standard lithotomy position. Following disinfection of the external genitalia and perineum with an antiseptic agent, a lubricant containing 2% lidocaine was instilled into the urethra at least 5 minutes prior to cystoscope insertion. A 17 Fr rigid sheath cystoscope (Karl Storz, Germany) was used for all procedures. Antimicrobial prophylaxis was not routinely used.

### Questionnaire Forms and Scoring

Pain was assessed using a Visual Analog Scale (VAS) ranging from 0 to 10, with 0 representing "no pain" and 10 indicating "unbearable pain". Immediately after the cystoscopy session, patients recorded their pain levels on a VAS form.

The State and Trait Anxiety Inventory (STAI), first introduced by Spielberg et al.,<sup>[5]</sup> is used to assess the presence and severity of current anxiety symptoms and the general tendency toward anxiety. The State Anxiety (STAI-SA) measures the current state of anxiety, while the Trait Anxiety (STAI-TA) evaluates more stable, long-term anxiety traits.

The Beck Anxiety Inventory (BAI) was developed by Beck et al.<sup>[6]</sup> to discriminate anxious patients from non-anxious ones with an emphasis on the physical manifestations of anxiety symptoms. Higher scores indicate greater anxiety in both questionnaires.

In our study, we calculated the scores of all questionnaires through the formulas that we created in the Microsoft Excel Worksheet version 2020 (Microsoft Inc., WA, USA) in accordance with those described in the original studies.

### Statistical Analysis

All statistical analyses were performed using SPSS version 16.0 (IBM, Chicago, IL, USA). Numbers, standard deviations and medians were used for descriptive statistics of the study. The Mann-Whitney U test was used to compare the pain and anxiety scores between the two groups. Independent t tests were used to determine differences in age between the groups. Pearson's chi-square test was used to evaluate differences in gender between groups. A p-value of <0.05 was considered statistically significant.

## RESULTS

Based on the inclusion criteria, 26 women and 83 men who underwent cystoscopy were enrolled in the study. Of the patients, the mean age was 50±14. All participants consented to take part and complete the questionnaires, and they were assigned to one of two groups. Among the 109 study patients, 54 of them underwent cystoscopy with an appointment date while 55 of them underwent on the day of admission to the hospital. Patients were informed about the results of cystoscopy after

**Table 1. Basic characteristics and questionnaire scores of patients**

	n	%	Median (IQR)
Age at cystoscopy, year (mean±SD)			50±14
Gender			
Female	26	23.9	
Male	83	76.1	
Appointment			
No	55	50.5	
Yes	54	49.5	
VAS (before cystoscopy)			3 (0–5)
VAS (after cystoscopy)			3 (1–6)
VAS (difference)			0 (0–2)
BAI (before cystoscopy)			10 (4–18)
BAI (after cystoscopy)			8 (3–17)
BAI (difference)			0 (–3–2)
STAI-SA (before cystoscopy)			43 (35–49)
STAI-SA (after cystoscopy)			41 (34–50)
STAI-SA (difference)			1 (–3–4)
STAI-TA (before cystoscopy)			40 (35–46)
STAI-TA (after cystoscopy)			41 (34–47)
STAI-TA (difference)			0 (–3–5)

IQR: Interquartile range; SD: Standard deviation; VAS: Visual analog scale, BAI: Beck anxiety inventory; STAI: State and trait anxiety inventory, STAI-SA: State and trait anxiety inventory–state anxiety, STAI-TA: State and trait anxiety inventory–trait anxiety

completing the post-procedure pain and anxiety forms so that the results would not affect their anxiety about the procedure.

Basic characteristics of patients, before and after cystoscopy questionnaire scores and their calculated difference scores are summarized in Table 1.

Comparison of the basic characteristics of patients, before and after cystoscopy questionnaire scores and their calculated difference scores are summarized in Table 2.

Among the patients median age of the group without an appointment was 54±15 and 46±13 for the group with appointment. Median age was higher in the group without an appointment ( $p=0.006$ ). There was no significant gender difference observed between the groups.

VAS scores measured after the procedure were significantly higher in the group with appointment ( $p=0.014$ ). Additionally, no statistically significant differences were found between the two groups in the STAI, including both STAI-SA and STAI-TA, as well as in the BAI.

## DISCUSSION

According to the results of our prospective randomized single-center study, median age was higher in the group without an appointment, VAS scores measured after the procedure were significantly higher in the group with appointment but no statistically significant differences were found between the two groups in the anxiety scores and also there was no significant gender difference.

Cystoscopy is one of the most commonly performed outpatient procedures in urology. It was first introduced in urology by Bozzini in 1805, and since then, advancements in technology have made flexible cystoscopes a widely used tool in urologists' practices.<sup>[7]</sup> Despite this, rigid cystoscopes remain frequently used in developing countries for outpatient procedures due to their lower cost, superior optical clarity, and easier handling.<sup>[8]</sup> We performed our study with rigid cystoscopy.

This study was planned to evaluate the effect of delayed cystoscopy procedure on patients' pain and anxiety. The results of our study report that the delayed cystoscopy procedure increased the pain scores of the patients but did not show any effect in terms of anxiety status. In contrast to our study's findings, previous researches have frequently indicated that higher levels of anxiety are often linked to increased reports of pain.<sup>[9]</sup> There is a biological association between the physiological effects of anxiety and the perception of pain. Intense emotional distress triggers the sympathetic nervous system, leading to a signal being sent through the hypothalamus to promote the release of acetylcholine from preganglionic neurons. Consequently, this process will result in the release of epinephrine and norepinephrine from the adrenal cortex.<sup>[10]</sup>

Epinephrine induces mechanical hyperalgesia and sensitizes nociceptor-like neurons through beta-adrenergic receptor activation. The degree of hyperalgesia is proportional to epinephrine levels. Consequently, anxiety, which elevates epinephrine, enhances pain perception via this adrenergic mechanism.<sup>[11]</sup>

The primary causes of surgery-related anxiety are the decision to undergo surgery and the waiting period until the surgery date. This anxiety can vary based on the treatment method, the duration of the treatment, and the potential outcomes. Despite this, most patients agree to proceed with the treatment. However, it has been reported that 5% of patients refuse treatment due to anxiety.<sup>[12]</sup> According to our results, there were no patients who refused cystoscopy procedure because of anxiety, but delayed cystoscopy increased the pain status of the patients. While there was a

**Table 2. Comparison of the basic characteristics and pain and anxiety states of the groups**

	Appointment						p
	No (n=55, 50.5%)			Yes (n=54, 49.5%)			
	n	%	Median (IQR)	n	%	Median (IQR)	
Age at cystoscopy, year (mean±SD)			54±15			46±13	<sup>a</sup> 0.006*
Gender							
Female	14	25.5		12	22.2		<sup>b</sup> 0.692
Male	41	74.5		42	77.8		
VAS (before cystoscopy)			2 (0–5)			3 (1–4)	<sup>c</sup> 0.445
VAS (after cystoscopy)			2 (1–5)			4 (3–6)	<sup>c</sup> 0.014*
VAS (difference)			0 (0–1)			1 (0–2)	<sup>c</sup> 0.057
BAI (before cystoscopy)			8 (2–15)			11 (5–19)	<sup>c</sup> 0.045*
BAI (after cystoscopy)			7 (3–16)			9 (4–17)	<sup>c</sup> 0.231
BAI (difference)			0 (-4–3)			-1 (-3–1)	<sup>c</sup> 0.449
STAI-SA (before cystoscopy)			42 (36–48)			43 (34–49)	<sup>c</sup> 0.956
STAI-SA (after cystoscopy)			40 (34–50)			44 (35–50)	<sup>c</sup> 0.438
STAI-SA (difference)			-1 (-5–4)			2 (-1–4)	<sup>c</sup> 0.102
STAI-TA (before cystoscopy)			38 (35–45)			42 (36–47)	<sup>c</sup> 0.139
STAI-TA (after cystoscopy)			40 (32–44)			42 (37–47)	<sup>c</sup> 0.145
STAI-TA (difference)			0 (-3–5)			0 (-2–4)	<sup>c</sup> 0.556

\*:  $p < 0.05$ ; <sup>a</sup>: Student-t test; <sup>b</sup>: Pearson Chi-Square test; <sup>c</sup>: Mann-Whitney U test. IQR: Interquartile range; SD: Standard deviation; VAS: Visual analog scale, BAI: Beck anxiety inventory; STAI: State and trait anxiety inventory, STAI-SA: State and trait anxiety inventory-state anxiety, STAI-TA: State and trait anxiety inventory-trait anxiety

difference in terms of pain, there was no difference in terms of anxiety. The main reason for this may be that our study was conducted with a small population.

In contrast to our results in a recent randomized study, they found statistically significant reductions in VAS and STAI scores in patients who were scheduled for flexible cystoscopy.<sup>[13]</sup> In a different study, Wetsch et al.<sup>[14]</sup> also reported that patients undergoing outpatient procedures experienced higher anxiety levels compared to those with scheduled procedures. Considering these findings, despite the numerous benefits of outpatient procedures, patients often experience elevated anxiety due to a lack of preparation for the operation.

However, in our study, we found that the pain scores of the group with an appointment were higher. This suggests that although we did not find a difference in anxiety scores, the waiting time caused an increase in the pain scores of the patients. In fact, the most important studies that support our results are the studies showing the high anxiety and pain scores of patients with delayed treatments due to the COVID-19 pandemic. One study found that surgical delays caused by the COVID-19 pandemic led to increased pain and

anxiety among many patients undergoing total joint arthroplasty. Consistent with the results of our study, patients who reported higher levels of pain were significantly more likely to experience an increase in pain during the waiting period.<sup>[15]</sup>

When considering gender, it was found that women experienced moderate to high levels of anxiety regarding invasive procedures.<sup>[13,16]</sup> One of the limitations of our study seems to be that pain and anxiety scores between genders were not evaluated as a subgroup.

According to the researchers, patients who were well-informed about the procedure experienced low levels of anxiety and pain.<sup>[17]</sup> In our study, we ensured that all patients were comprehensively briefed about the procedure, including possible complications and expected outcomes. We think that one of the reasons why there was no difference in anxiety scores in our study was the detailed information given to the patients.

Studies investigating the link between education level and anxiety have found that lower educational attainment is associated with higher anxiety scores, irrespective of whether an appointment was made or not.<sup>[18,19]</sup> In our study, the patients' education levels were not analyzed.

The strengths of this study include the fact that it is a prospective randomized study and that the procedure was performed by single surgeon in a single-center. However, the present study has several limitations that need to be considered. Firstly, it is a small, single-center study. Future research could benefit from larger, multicenter trials involving a broader population to enhance the robustness of the findings. Secondly, the VAS, BECK and STAI scores relied on self-reported data, which are inherently subjective to some extent. In addition, gender and education levels, which are among the determinants of anxiety, were not evaluated in our study.

## CONCLUSION

In centers that evaluate high-volume patients, diagnostic and therapeutic modalities are associated with long waiting times. According to our results, although the change in anxiety scores was not significant in the group given an appointment compared to the group not given an appointment, pain scores increased. In order to reduce the pain levels of the patients, it would be an appropriate approach to plan cystoscopy as soon as possible after the indication.

## Disclosures

**Ethics Committee Approval:** The study was approved by the İstanbul Training and Research Hospital Non-interventional Clinical Research Ethics Committee (No: 2012-57, Date: 20/01/2012).

**Authorship Contributions:** Concept: H.A.A.; Design: H.A.A.; Supervision: U.Y., M.K.; Data Collection or Processing: E.E., E.O.; Analysis or Interpretation: U.Y.; Literature Search: E.E., E.O.; Writing: H.A.A.; Critical review: H.A.A., U.Y., E.O., E.E., M.K.

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**Informed Consent:** Written informed consent was obtained from all patients.

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