

## The effect of an information video on preoperative anxiety level before percutaneous nephrolithotomy procedure: A prospective, randomized trial

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### ABSTRACT

**INTRODUCTION:** We aimed to show the effect of patient information videos on preoperative anxiety before performing the percutaneous nephrolithotomy (PCNL) for kidney stones.

**METHODS:** This study was designed as a randomized, controlled trial with patients scheduled for PCNL operation for kidney stones. Demographic information, such as age, gender, and American Society of Anesthesiologists (ASA) score, were collected. State-Trait Anxiety Inventory (STAI) was used to measure anxiety levels. Before informing the patients, anxiety levels were evaluated using the STAI-state (pre-information STAI-S) and STAI-trait (STAI-T). Patients were randomly divided into two groups: both groups received written and verbal information, while the “video” group was also shown a video of a PCNL procedure. The post-information anxiety levels of both groups were evaluated using STAI-S (post-information).

**RESULTS:** A total of 109 patients were included in the study and 50 patients were included in each group after nine patients were excluded. The participants in the two groups were similar in terms of gender distribution, mean age, and pre-information STAI-S scores. Post-information STAI-S scores were statistically significantly lower in the video group ( $p=0.02$ ). There was no significant difference between post-information and pre-information STAI-S scores in the no-video group ( $p=0.86$ ), whereas a significant decrease was found in post-information STAI-S scores in the video group ( $p<0.01$ ).

**CONCLUSIONS:** In addition to written and verbal information before PCNL operations, informative videos are an inexpensive, effective method to reduce preoperative anxiety levels. Video-based briefing may be routinely used in addition to preoperative verbal and written information.

### INTRODUCTION

Urolithiasis is one of the most common urological diseases. Its estimated prevalence is 1–13% and may vary according to different regions.<sup>1</sup> Although treatment alternatives have increased with technological developments and miniaturization, percutaneous nephrolithotomy (PCNL) is still the primary treatment procedure for large kidney stones. Untreated or delayed kidney stones can cause permanent kidney damage.

Before the surgical procedure, patients may experience high anxiety due to fear of death, fear of anesthesia, fear of failure to heal, and fear of organ loss.<sup>2</sup> Inability to understand or comprehend surgical procedures clearly contributes to preoperative anxiety. While high anxiety may cause patients to avoid or delay treatment, it may also cause organic pathologies, such as preoperative hypertension and arrhythmia.<sup>3</sup>

Oral and written information is routinely given to patients about the procedure to be performed before the operation. It has been shown that adding visual information to written information contributes to patient understanding. Moseley et al determined that the comprehension and recall of informed consent before cataract surgery differed according to the presentation method.<sup>4</sup> Visual and video-based tools increase the perception power of the patient; therefore, a substantial amount of information can be given about the procedure that is more difficult to explain verbally. There are studies

showing that preoperative anxiety in patients is reduced by video-based information.<sup>5-8</sup>

We aimed to show the effect of animated information videos on patients' preoperative anxiety before performing PCNL for kidney stones.

## METHODS

This study was designed as a randomized, controlled trial with patients scheduled for PCNL for kidney stones in Basaksehir Cam and Sakura City Hospital between January 2021 and January 2022. Local ethics committee approval was obtained.

Patient demographic information, such as age, gender, and previous hospitalization status, as well as medical data, such as American Society of Anesthesiologists (ASA) score and kidney stone characteristics, were collected from interviews with patients and medical records.

The study cohort was selected from a group of patients who had not had urinary system stone surgery before. Patients who could not perceive video due to vision or hearing problems, those who use psychiatric and anxiolytic drugs or had psychiatric diseases and anxiety disorders, and those who could not fill out the information form due to lack of mental skills and illiteracy were excluded from the study.

Simple randomization method was applied to avoid intervention contamination. Randomization was done by dividing the patients in a 1:1 ratio into groups according to the order of admission. Written and video information was given to the video group before the operation, while only written information was given to the no-video group.

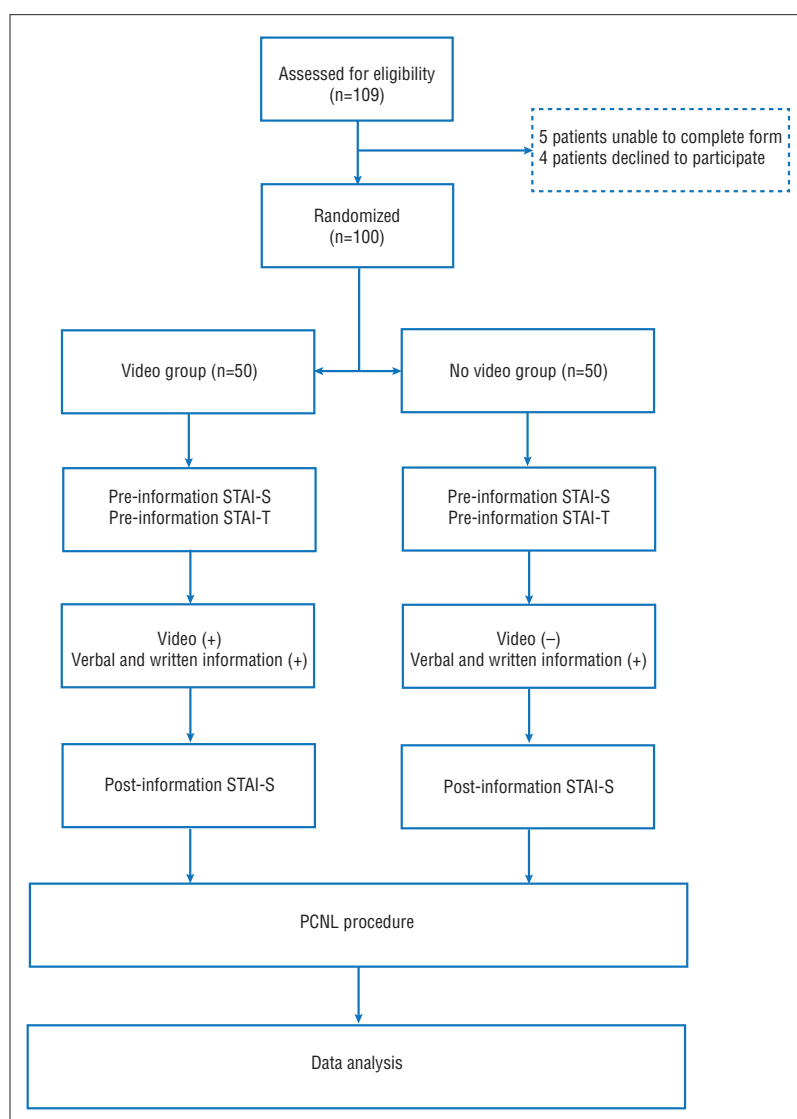
Before all patients scheduled for PCNL operation were verbally informed, their baseline anxiety levels were assessed using the Turkish version of the State-Trait Anxiety Inventory scale (pre-information STAI-state [STAI-S] and STAI-trait [STAI-T]).<sup>9</sup> The STAI-T scale measures long-term anxiety levels, whereas the STAI-S scale aims to measure anxiety at the given time. STAI-S and STAI-T each consist of 20 items with a four-point Likert scale. The total weighted score for the reverse statements is subtracted from the total weighted score for direct statements, and a constant value is added to this number. This value is 50 for the STAI-S and 35 for the STAI-T. The highest score that can be obtained from the scale is 80, and the lowest is 20.

Post-information anxiety levels of both groups were re-evaluated using the STAI-S (post-information). The flowchart showing the design of the study is shown in Figure 1. A single physician (MB) provided patients with

information and helped them fill out the questionnaires. The surgical procedure was performed by surgeons who were blinded to the randomization of the patients.

## Video information

The animated video from the European Association of Urology (EAU) patient information project (<https://patients.uroweb.org/videos/percutaneous-nephrolithotomy-pcnl-video/>) was used for to inform patients in the video group. This video is a 3D, animated video with English narration lasting approximately three minutes. The video was simultaneously translated into Turkish and the patient was allowed to ask questions at any time.



**Figure 1.** Participant flow diagram. PCNL: percutaneous nephrolithotomy; STAI: State-Trait Anxiety Inventory; STAI-S: STAI-state; STAI-T: STAI-traits.

**Table 1. Patient demographics, pre-information STAI and ASA comparisons between video and no-video groups**

	No-video group (n=50)	Video group (n=50)
Age (years)	40±17.25	48.86±17.54
STAI-T (mean±SD)	35.20 ± 3.35	36.70 ± 4.40
Gender(female/male)	21/29	18/32
ASA score (ASA 1–2/ASA 3–4)	34/16	33/17
Location of the stone (right/left)	31/19	30/20
Staghorn	12 (24%)	14 (28%)
Isolated pelvis	21 (42%)	24 (48%)
Isolated calyx	6 (12%)	4 (8%)
Multipl calyx	11 (22%)	8 (16%)
Side (right/ left)	24/26	22/28
STAI-S (mean±SD)(pre-information)	39.23±6.63	39±7.41

ASA: American Society of Anesthesiology; STAI-S: State-Trait Anxiety Inventory, state anxiety; STAI-T: State-Trait Anxiety Inventory, trait anxiety.

**Table 2. Change of STAI-S after information between groups**

	STAI-S mean±SD) (pre-information)	STAI-S (mean± SD) (post-information)	p
Video group	39±7.41	33.62±2.43	<0.01
No-video group	39.23±6.63	38.81±10.7	0.86

SD: standard deviation; STAI-S: State-Trait Anxiety Inventory, state anxiety.

### Statistical analysis

Data analysis was performed using IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL, U.S.). A normal distribution of the quantitative data was checked using Kolmogorov-Smirnov test. For intergroup comparisons, Chi-squared test was used for categorical variables and Student's t-test for continuous variables. Paired samples t-test was used to evaluate in-group anxiety scores. A p-value <0.05 was considered statistically significant.

### RESULTS

The eligibility of 109 patients for the study was assessed and nine patients were excluded from the study (four patients declined to participate, five patients could not fill out the form). Demographic characteristics and data of patients are shown in Table 1. The mean age of the patients who participated in the study was 40±17.25 years in the video group and 48.86±17.54 years in the no-video group (p=0.34).

The participants in the two groups were similar in terms of gender distribution.

There was no statistically significant difference between the groups in terms of pre-information STAI-S scores (p=0.88). Post-information STAI-S scores were lower in the video group.

While there was no significant difference between the pre-information and post-information STAI-S scores in the no-video group (p=0.86), there was a significant decrease in the post-information STAI-S scores in the video group (p<0.01) (Table 2).

Because high ASA score can have the potential effect of increasing the level of anxiety, patients were divided into two groups according to their ASA scores: low (ASA 1–2) and high (ASA 3–4). ASA score distribution was similar in both groups.

### DISCUSSION

As in many surgical operations, high anxiety levels are observed in kidney stone patients before surgery. It has been reported that patients with kidney stone have a 50% increased risk of anxiety and a 26% increased risks of depression compared to those without urolithiasis.<sup>10</sup> It has been shown that one of the biggest causes of patient anxiety is due to lack of knowledge in the pre-operative period.<sup>11</sup> Therefore, it is very important to ensure that patients are well informed. The information should be simple, easy to understand, and appeal to all patients of different ages and educational levels.

In this study, we evaluated the effect video information on patients' anxiety levels before PCNL. An EAU animated video was used to provide information pre-procedure. To our knowledge, this is the first study to evaluating anxiety levels with video-based information before PCNL procedure. In this study, we observed that adding video information to written and verbal information significantly reduced anxiety levels.

We showed that a reduction in preoperative anxiety can be attributed to the audiovisual presentation, indicating that it might be easier to understand a video presentation than an only verbal briefing. Informing the patient with video-based information was more successful, and the patients understood and perceived the procedure and the post-procedure process more easily.

Verbal and written information can be difficult to standardize. It is noteworthy that the quality of oral information depends on the communication skills of the physician and the patient, and the quality of written information depends on the patient's reading comprehension skills.

Therefore, there is a need for standardized optimal methods to better inform patients. One of the

practical ways to provide preoperative information in a standardized way is video-based information. Video-based information has the advantage of being able to demonstrate information to patients in a way that is not possible verbally.

While several materials, such as leaflets, booklets, and even audiotapes, have been used to provide patients with surgical information,<sup>12-14</sup> there is research showing that a multimedia-based presentation of information improves patient retention, and that videos lead to better results in surveys than verbal and written material.<sup>15,16</sup> Shukla et al showed that the risks and benefits of cataract surgery were better understood when patients were provided with a video-based presentation combined with an information sheet.<sup>15</sup>

There are various prospectively designed studies on video information in non-urological procedures in the literature. Using the Amsterdam Preoperative Anxiety and Information Score (APAIS), Ahmed et al reported that preoperative patient information videos reduced anxiety levels before cataract surgery.<sup>5</sup> Miremberg et al measured anxiety levels using STAI in primary cesarean section patients (video exposure before, on the day of operation, and on day 1 postpartum).<sup>7</sup> They reported that informative video before primary cesarean section reduced maternal anxiety before and after the procedure. Jjala et al reported that preoperative multimedia information reduces the anxiety of patients undergoing surgery under regional anesthesia.<sup>6</sup>

Similar to the current literature, our study found that the anxiety levels decreased with video information. Owing to the quality of information, patients in our cohort had a good understanding of the technical details/steps of the surgery and the anatomical structure of the kidney. In addition, possible complications, such as bleeding, were easily explained by showing the calyceal vessels in the animated video. Postoperative Foley catheter and nephrostomy catheter placement were also shown and well explained in the video, resulting in patients who were more compliant and better prepared for the surgical operation.

### Limitations

Our study is not without limitations.

First of all, the video shown to patients focused exclusively on PCNL and thus, the patient's anxiety due to anesthesia can not be completely discounted. Second, other potential predictors of patient anxiety, such as income level, cultural structure, or quality of life, were not investigated in this study.

### CONCLUSIONS

In addition to written and verbal information before PCNL, informative videos are an inexpensive, effective way to reduce preoperative anxiety levels.

COMPETING INTERESTS: The authors do not report any competing personal or financial interests related to this work.

This paper has been peer-reviewed.

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