

**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 state anxiety scale (pre-information STAI-S and 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 (Sorokin et al., 2017). 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 (Perks et al., 2009). One of the reasons for having high anxiety before surgery is fear of the unknown (Gürsoy et al., 2016). 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 (Vetter et al., 2015). Oral and written information is routinely given to the patients about the procedure to be performed before the operation. It has been shown that adding visual information to written information contributes to patient information. It has been shown that adding visual information to written information contributes to patient information. Moseley et al. (Moseley, 2006) determined that the comprehension and recall of informed consent before cataract surgery differed according to the presentation method. Visual and video-based assistive tools increase the perception power of the patient, and so a substantial amount of information can be given about the procedure that cannot be explained verbally. There are studies showing that preoperative anxiety in patients is reduced by video-based information (Ahmed et al., 2019; Jlala et al., 2010; Miremberg et al., 2022; Toralla et al., 2022).

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

## METHODS

This study was designed as a randomized controlled trial with patients scheduled for PCNL operation due to kidney stones in Basaksehir Cam and Sakura City Hospital between January 2021 and January 2022, after the approval of the local ethics committee.

Demographic information of the patients such as age, gender, localization of the stone, occupation, marital status, previous hospitalization status and medical data such as ASA score were collected from interviews with patients and medical records.

Simple randomization method was applied to avoid intervention contamination. Before all patients scheduled for PCNL operation were verbally informed, their baseline anxiety levels were assessed using the state anxiety scale (STAI-S (pre-information) and STAI-T). Randomization was done by dividing the patients into 1:1 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'. Post-information anxiety levels of both groups were re-evaluated using the STAI-S (post-information). The flow chart showing the design of the study is shown in Figure 1. Filling out the questionnaires and informing the patients was done by a single physician (MB). The

surgical procedure was performed by surgeons who was blinded to the randomization of the patients.

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

The Turkish version of the State-Trait Anxiety Inventory (STAI) was used to measure anxiety levels (Oner N, 1985). Trait anxiety (STAI-T) scale measures long-term anxiety levels whereas State anxiety (STAI-S) scale aims to measure anxiety in 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 score is 20.

### Video information

The animation video from the EAU patient information (<https://patients.uroweb.org/videos/percutaneous-nephrolithotomy-pcnl-video/>) project was used for the video information for the 'video group'. This video is a 3d-animated video with English narration and about 3 minutes. The video was simultaneously translated into Turkish and the patient was allowed to ask questions at any time.

### Statistical analysis

Data analysis was performed using IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL). A normal distribution of the quantitative data was checked using Kolmogorov-Smirnov test. For intergroup comparisons, chi-squared test was used for categorical variables, student's t-test was used for continuous variables. Paired samples-t test was used to evaluate in-group anxiety scores. p value less than 0,05 was considered statistically significant.

## RESULTS

The eligibility of 109 patients for the study was assessed and 9 patients were excluded from the study (4 patients declined to participate in the study, 5 patients could not fill 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  $40 \pm 17.25$  years in the video group and  $48.86 \pm 17.54$  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 'no video group' ( $p=0.86$ ), there was a significant decrease in the post-information STAI-S scores in 'video group' ( $p < 0,01$ ) (Table 2).

Because high ASA score can have a potential effect to increase the level of anxiety; patients were divided into two groups according to their ASA scores as 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 the surgical procedure. It has been reported that patients with kidney stone have increased 50% risks of anxiety and increased 26% risks of depression compared to those without urolithiasis (Lien et al., 2015). It has been shown that one of the biggest causes of patient anxiety may be due to lack of knowledge in the preoperative period (Lin et al., 2016). 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 different educational levels. In this study, we evaluated the effect video information on patients' anxiety levels before PNL. European Association of Urology (EAU) animation videos were used for video information. 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.

The reduction in preoperative anxiety can be attributable to the audiovisual presentation indicating that it might be easier to understand a video presentation than a purely 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. In this way, we think that the fear of the unknown is minimized and preoperative anxiety levels are reduced.

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 have advantage of being able to demonstrate information to patients in a way that is not possible verbally.

Different materials such as leaflets, booklets, audiotapes were used to provide better information (Byrom et al., 2003; Schwartz-Arad et al., 2007; van Zuuren et al., 2006). There is researchs showing that multimedia-based presentation of information to patients improves patient retention, with videos leading to better results in information surveys than verbal and brochure information provision (Shukla et al., 2012; Wollinger et al., 2012). Shukla et al.(Shukla et al., 2012) showed that the risks and benefits of cataract surgery of a video based on presentation combined with an information sheet are better understood.

There are various prospectively designed studies on video information in non-urological procedures in the literature. Ahmed et al. (Ahmed et al., 2019) reported that preoperative patient-information video reduced anxiety levels before cataract surgery. They used the Amsterdam Preoperative Anxiety and Information Score (APAIS) scale to measure

anxiety levels. Miremberg et al. (Miremberg et al., 2022) measured anxiety levels using STAI in primary cesarean section patients (before video exposure, on the day of operation, and on day 1 postpartum). They reported that informative video before primary cesarean section reduced maternal anxiety before and after the procedure. Jlala et al. (Jlala et al., 2010) reported that preoperative multimedia information reduces the anxiety of patients undergoing surgery under regional anaesthesia. They measured their anxiety levels with VAS and STAI. We also provided video information before PNL surgery and measured anxiety levels before and after video information using STAI. Similar to the literature, we found that the anxiety levels decreased with video information.

Thanks to the quality information, the patients had a good grasp of the technical details of the surgery and better learned the anatomical structure of the kidney and the steps of the procedure. In addition, possible complications such as bleeding were easily explained by showing the calyceal vessels in the animation video. Postoperative Foley catheter and nephrostomy catheter placement was explained in the comfortable way and shown in the video. Video-based information enabled both preoperative anxiety reduction and information about the postoperative process and complications. Thanks to this information, the patients were better prepared for the surgical operation.

We think that the animation videos we prefer advantageous in terms of attracting attention. Since there are no blood and real tissue images, it does not cause fear in the patient and become memorable thanks to the 3-dimensional and colorful visuals. We think that thanks to the animation video, the operation has become easier to understand and compliance of patient has increased. In addition, we think that the presence of a physician who makes simultaneous translation in our study and who can ask questions wherever the patient wants is a strong aspect of our study compared to similar studies that provide video-based information. We preferred the video that is available on EAU's website for video information, The EAU Patient Information platform is open access for all patients and is a project established for better patient information. These animation videos are also easily accessible on YouTube (Google, USA).

### **Limitations**

First of all, the video information is the animation of the operation to be performed, and the patient's anxiety due to anesthesia may not be completely excluded. Secondly, other potential predictors of patient anxiety, such as income level, cultural structure, or quality of life, were not investigated in this study.

In addition to written and verbal information before PCNL operations, informative videos are safe, inexpensive, non-invasive and effective method to reduce preoperative anxiety levels. We think that video-based briefing may be routinely used in addition to preoperative verbal and written information.

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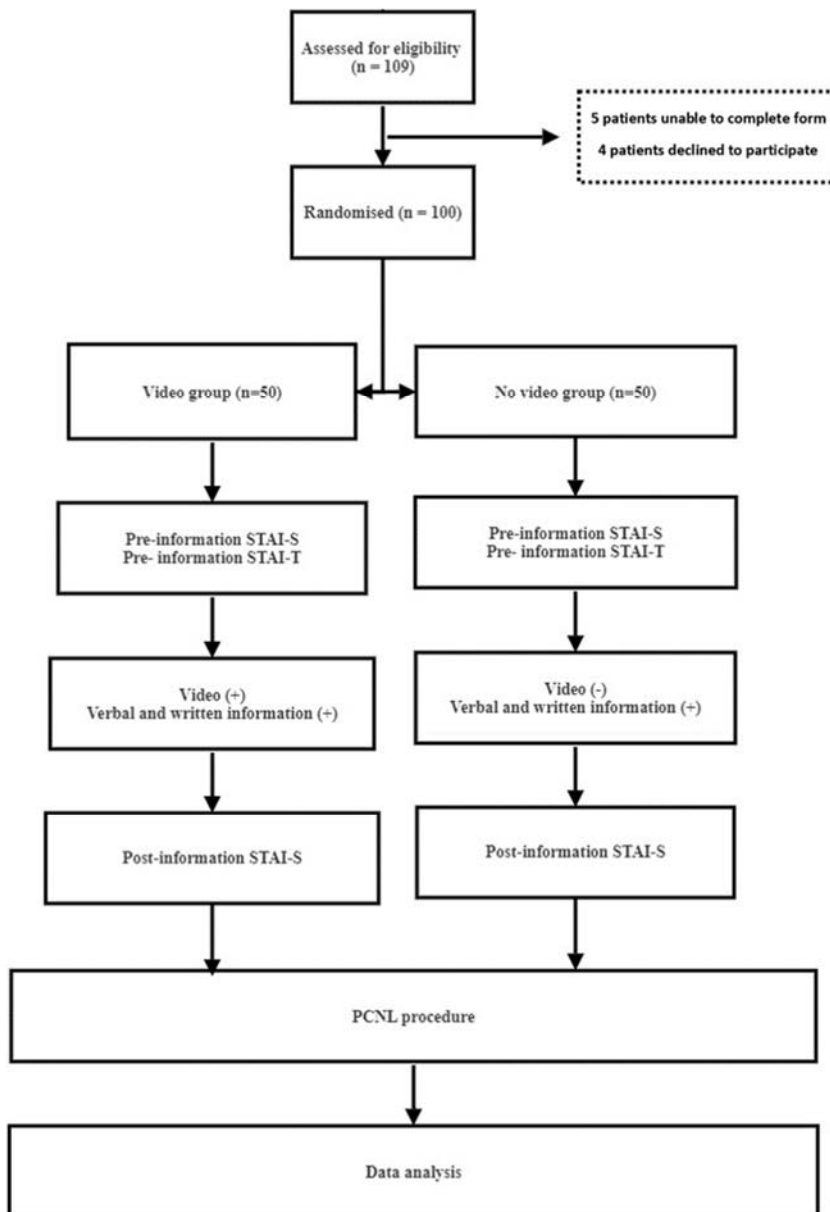
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## Figures and Tables

Figure 1. Participant flow diagram.





	<b>No-video group (n=50)</b>	<b>Video group (n=50)</b>
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.

	<b>STAI-S (mean+SD) (pre-information)</b>	<b>STAI-S (mean+ SD) (post-information)</b>	<b>p</b>
Video group	39±7.41	33.62±2.43	<b>&lt;0.01</b>
No-video group	39.23±6.63	38.81±10.7	0.86

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