North Clin Istanb 2021;8(1):76–81
doi: 10.14744/nci.2020.65707

Original Article ANESTHESIOLOGY & REANIMATION

The role of video-based multimedia information in reduction of anxiety before dilatation and curettage

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ABSTRACT

OBJECTIVE: Considerable amount of women undergoing dilatation and curettage (D&C) are subject to preoperative anxiety. We hypothesized that the implementation of video-based multimedia information (MMI) before the D&C might facilitate patients' education and provide clear information regarding the procedure. This study aimed to compare the impact of video-based MMI and conventional written information on anxiety, pain severity, and satisfaction in patients undergoing D&C.

METHODS: Seventy four women scheduled for D&C for abnormal uterine bleeding were enrolled in this prospective randomized study. Subjects were assigned to receive a video-based MMI or conventional written information (controls). The trait and state anxiety were assessed using the State and Trait Anxiety Inventory (STAI) before the MMI or written information. STAI-state (STAI-S) was repeated after the application of the MMI or written information. All patients underwent D&C by the same gynecologist. Following D&C, patient satisfaction and procedural pain were ranked using a Likert scale and Visual Analogue Scale.

RESULTS: Post-informational STAI-S score was significantly lower than the pre-informational STAI-S score in the video group ($p<0.001$), whereas no significant change occurred in STAI-S score in the control group ($p=0.210$). The satisfaction rate of the patients receiving MMI before the D&C was significantly higher than the satisfaction rate of the controls (75% vs. 50%, $p=0.027$).

CONCLUSION: Implementation of MMI before the D&C procedure is associated with less anxiety, less severe postoperative pain and improved patients satisfaction, compared to the conventional written information.

Keywords: Dilatation and curettage; anxiety; pain; satisfaction.

Cite this article as: *Yilmaz G, Akca A, Ay N, Koroglu N, Omaygenc DO, Ozdemir I, et al. The role of video-based multimedia information in reduction of anxiety before dilatation and curettage. North Clin Istanb 2021;8(1):76–81.*

Anxiety, which is defined as is defined as a feeling of being nervous or worried, often as a result of fear of a possible future event, is common among patients undergoing surgery [1]. Previous evidence has shown that waiting for an invasive procedure may negatively affect surgical outcomes and lead to blood pressure elevation and arrhythmias [2]. The lack of knowledge about an anticipated surgical procedure has been documented as one of the most important components associated with preoperative anxiety [3, 4].

Dilatation and curettage (D&C) basically include dilatation of the cervix and removal of the uterus content.

Received: March 10, 2020 *Accepted:* October 20, 2020 *Online:* November 23, 2020

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D&C can either be used for diagnostic or therapeutic purposes [5, 6]. Although D&C is not defined as a major operation, this procedure has invasive characteristics and may be associated with severe postoperative pain and periprocedural anxiety. A recent trial by Roomruangwong et al. [7] has demonstrated that preoperative anxiety is quite common among patients undergoing D&C.

Several kinds of pharmacological agents, such as anxiolytics and sedatives, are generally administered to relieve preoperative anxiety in the in-patient setting [8, 9]. However, each agent has individual side-effects besides their anxiolytic effects. Recent data have shown that adequate patient education before the surgery can decrease surgery-related anxiety and increase patient satisfaction [10]. Utilization of non-pharmacological care would, therefore, be preferable to the pharmacological agents. The utilization of multimedia information (MMI) as an adjunct to conventional written information has been reported to improve patients' understanding of the forthcoming procedure, reduce surgery-related anxiety, and improve patient satisfaction in various surgical settings [11, 12]. However, the role of the video-based MMI before the D&C has not been studied yet.

The present study purposed to examine the effects on video-based MMI on anxiety, pain severity, and satisfaction in patients undergoing D&C.

Highlight key points

- Compared to conventional written information, a video-based multi-media information before the D&C reduces procedural anxiety and postoperative pain.
- Patient satisfaction may be improved with implementation of a video-based multi-media information.

MATERIALS AND METHODS

Patient Selection

This randomized, prospective study enrolled women aged between 18 and 60 years and scheduled for elective D&C between May 2019 and July 2019. Women with abnormal uterine bleeding were enrolled in this study if they were physically and mentally able to understand the items regarding the D&C procedure presented in the MMI. Exclusion criteria were as follows: presence of contraindication for D&C and presence of visual or auditory deficits or mental syndromes. Subjects with mental disorders or psychological disease and those taking antidepressant drugs were also excluded from this study. All subjects provided written informed consent before the enrollment. Institutional Ethical Committee approval was obtained before the subject enrolment (KAEK/2019.07.188). This study was registered with clinicaltrials.gov (NCT03930303). Results from our preliminary study with the first 16 patients were used for power calculations. We used "priori t-tests; the difference between two independent means" for post-information STAI state (STAI-S) measurements in MMI and control groups (STAI-S score of the MMI group: 45.4±7.5, STAI-S score of the controls: 42.2±3.0, alpha error: 0.05, power: 0.95, effects size: 0.71) [13]. Power calculation provided that at least 46 patients (23 patients for each group) were required for an adequate sample size.

State and Trait Anxiety Inventory

All patients were requested to respond to the STAI, which is a validated and widely used self-report questionnaire assessing both state and trait anxiety, before randomization [14, 15]. STAI includes two questionnaires with 20 questions in each; STAI-S, which intends to evaluate acute anxiety, and trait anxiety (STAI-T) that measures long term anxiety. Each answer is scored on a scale of 1–4 and added to reach a final score. The overall score ranges between 20 and 80; the higher score indicates a higher level of anxiety.

Randomization

Seventy-four patients, who were eligible for this study, were randomly allocated to one of the study groups using a simple randomization technique (Fig. 1). Patients in the video-based MMI group received an MMI video, which described all details of the forthcoming procedure. Subjects allocated to the control group received written information describing the details of the procedure. Fifteen minutes after the MMI or written information, the STAI-S questionnaire was repeated in all patients.

Dilatation and Curettage

All D&C procedures were performed by the same gynecologist (>10 years of professional experience), using the Sims curette number 3 or 4 and tenaculum, under general anesthesia. Midazolam (0.05 mg/kg iv) was used for sedation. For general anesthesia, propofol (10 mg/ml) was administered slowly (20 mg/10s) until the patient no longer responded to external stimulus. Additional propofol was administered in 10-mg increments

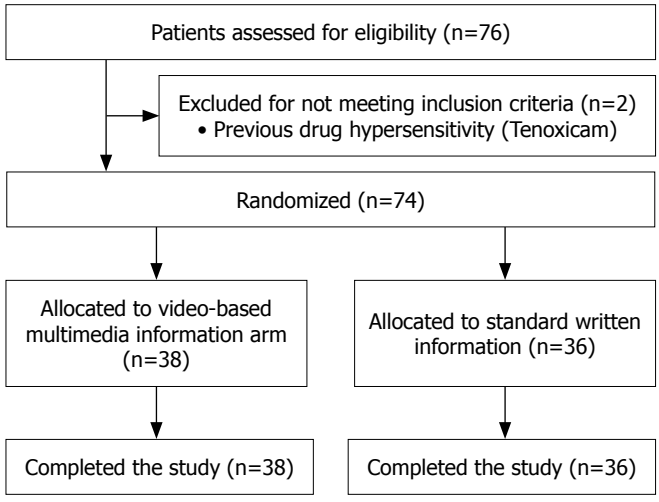

Figure 1. Flow-chart demonstrating patient enrollment.

when needed. Fentanyl (1 μg/kg/iv) was administered for pain control. Tenoxicam 20 mg i.v. was used as a rescue analgesic to relieve the postprocedural pain. Following the full recovery from sedation anesthesia in the D&C, patient satisfaction was evaluated using a four-point Likert scale (0; not satisfied, 1; poorly satisfied, 2; satisfied, 3; very satisfied) and pain severity was ranked using a ten-point Visual Analogue Scale VAS, 0; no pain, 10; most severe pain imaginable). A Likert scale score of ≥ two was assumed as satisfaction.

Primary and the Secondary Outcome

The change in the anxiety levels of patients in the two groups before the D&C was the primary outcome measure of this study. The difference in the procedural satisfaction rate and post-procedural pain between the groups was the secondary outcome measure.

Statistical Analysis

Statistical analyses were performed using the SPSS for Windows, version 17 (SPSS, Chicago, IL, USA). Shapiro-Wilk test was performed to test the distribution of the variables. Continuous variables were presented as mean±standard deviation (mean±SD) and categorical variables as frequency (n). Student's t-test, Mann–Whitney U-test, χ^2 -test or Fisher's exact tests were used for comparison of the groups. Comparison of the pre- and post- informational STAI-S scores of the two groups was performed by paired samples t-test. Two-sided p-value ≤0.05 was interpreted as statistically significant.

Table 1. Demographic and clinical features of the study population

	Control group (n=38)	Video-based MMI group (n=36)	p
Age (years)	34.1±9.6	31.8±6.4	0.221
BMI (kg/m^2)	25.6±5.1	25.9±3.8	0795
Parity	1.8±1.0	1.6±0.9	0.358
ASA Class			
I	47	44	0.801
II	53	56	
Pre-information STAI-S	45.4±5.8	45.1±5.3	0.812
STAI-T	48.6±4.5	49.2±5.1	0.615

Data are given as mean±standard deviation or frequency and the percentage. AUB: Abnormal uterine bleeding; PMB: Postmenopausal bleeding; STAI-T: State-trait anxiety index-trait; MMI: Multi-media information.

RESULTS

In the study, 74 patients (mean age 32.9±8.2 years) were enrolled. The control group consisted of 38 subjects who received written information before the STAI. MMI group included 36 patients who watched a video clip explaining the details of the D&C procedure. The demographic features of the study groups are given in Table 1. The groups were similar concerning age, body mass index, parity, American Society of Anesthesiologists Classification. Pre-information STAI-S and the STAI-T were also not different in the two groups.

Post-informational STAI-S score was significantly lower than the pre-informational STAI-S score in subjects receiving MMI (41.1±4.9 vs. 45.1±5.3, p<0.001), whereas STAI-S score did not change in the control group (45.2±5.1 vs. 45.4±5.8, p=0.210, Table 2). In addition, the satisfaction rate of the patients receiving MMI before the D&C was significantly higher than the satisfaction rate of the controls (75% vs. 50%, p=0.027). Moreover, the VAS score, indicating the severity of the procedural pain was significantly lower in the MMI group than that of the control group [2.5 (1–9) vs. 4 (1–9), p=0.008, Table 3]. None of the subjects required rescue analgesia with tenoxicam.

DISCUSSION

This study clearly demonstrates that MMI, rather than conventional written information, leads to a significant reduction in pre-procedural anxiety in patients under-

Table 2. The comparison of the STAI-state score before and after the video-based MMI or written information in the two groups

	Control group (n=38)	Video-based MMI group (n=36)	p
STAI-S pre-informational	45.4±5.8	45.1±5.3	0.812
STAI-S post-informational	45.2±5.1	41.1±4.9	**0.004**
p′	0.210	<**0.001**	

Data are given as mean±standard deviation. STAI-S: State-trait anxiety index-state; MMI: Multi-media information. p the p value derived from the comparison of the video and control groups. p′ the p value derived from the comparison of the pre- and post-informational STAI-S scores.

Table 3. Procedural satisfaction and pain scores of the study groups

	Control group (n=38)	Video-based MMI group (n=36)	p
VAS score	4 (1–9)	2.5 (1–9)	**0.008**
Satisfied with procedure (%)	50	75	**0.027**

Data are presented as median (minimum–maximum value) for continuous variables. VAS: Visual analog scale.

going D&C. Our findings also indicate that patients receiving a video-based MMI before D&C less suffer from procedural pain and experience higher satisfaction compared to the subjects receiving only written information.

Anxiety among patients undergoing various surgical procedures has been an issue not only for the patients but also for the health-care professional since the perioperative anxiety may be harmful concerning intraoperative hemodynamics and recovery [8]. Dilatation and curettage are commonly used in clinical practice for diagnostic and therapeutic options. Although D&C has not been classified as major surgery, this procedure is also associated with substantial anxiety comparable to the major surgical procedures. There is only one study investigated the rate of anxiety in patients undergoing D&C, which found out a preoperative anxiety prevalence of 23.2% in this group of patients [7].

Informing the subjects regarding the forthcoming surgery is an effective tool for reducing preoperative anxiety. Supplying appropriate information regarding the procedure for which they are scheduled and addressing their concerns about the surgery may reduce the anxiety concerning the surgery or intervention. However, the establishment of a faithful and confidential physician-patient relationship frequently requires a longer time than expected. Implementation of MMI before the surgery may facilitate patients' education and provide clear information rather than confusing and complex written information by the advantages of visual perception.

In the present study, post-informational STAI-S scores of the subjects receiving MMI was significantly lower than the pre-informational STAI-S scores, whereas no significant change was observed between the pre- and post-STAI-S scores in the control group. Currently, to our knowledge, there are no studies comparing the impact of a video-based education before D&C on procedural stress. Hence, this is the first research on this topic. However, several studies have shown that a video-based education reduces procedural anxiety (measured by STAI) in patients undergoing joint lavage for knee osteoarthritis, elective hip replacement surgery, or aesthetic surgery [16–18]. Ayral et al. [16] have shown in the randomized controlled trial of 112 patients scheduled to undergo joint lavage for knee osteoarthritis that preoperative anxiety was lower by half for subjects who received a piece of video information on joint lavage than that of the subjects who received no information. Danino et al. [17] investigated the efficacy of video information on patients undergoing breast reduction or abdominoplasty. The authors have reported that patients randomized to the MMI were significantly less anxious than those who received convention care before the surgery. Doering et al. [18] measured the urinary levels of cortisol, epinephrine, and norepinephrine in patients who were randomized to receive a video-based MMI or conventional care before elective hip replacement surgery. Their findings showed that preoperative anxiety assessed with STAI and the urinary cortisol excretion was lower in the MMI arm compared to that of the conventional care arm.

This study has also shown that the satisfaction rate of the subjects receiving MMI before the D&C is significantly higher than that of the controls. Although there are no previous studies investigating the role of a video-based education before D&C on patients' satisfaction several research, including other clinical settings, have revealed that a videotape educational intervention not only reduces the level of anxiety but also improves patients' satisfaction in subjects undergoing cardiac catheterization, tooth extraction, or emergency department process

[19–21]. Our findings, for the first time, indicate that a video-based education before D&C may be helpful in improving patients' satisfaction.

Another clinical important result of this study is the significant difference in procedural-pain between subjects receiving and not-receiving a video-based education before D&C. Those receiving a video-based education before D&C reported less procedural pain. This may be explained by the reduced levels of stress hormones, which are also responsible for the development of pain, in subjects' receiving a video-based education [22–24].

Our findings demonstrate that a video-based education reduces anxiety compared to the conventional written information given before the D&C procedure. To our knowledge, this study is first to show the efficacy of MMI in this group of patients. From this point of view, our findings are consistent with previous evidence indicating the role of preoperative video education in various surgical settings. Our findings also demonstrate that patients receiving an MMI before D&C experience less pain than those receiving conventional written information. Dilatation of the cervix, uterine manipulation, and the removal of the uterine content may cause pain during the D&C. Anxiety has been shown to act as risk factors for the perception of significant pain [25]. Reducing anxiety through the preoperative MMI may facilitate patients' preparation for the forthcoming surgery and consequently make them cope better with postoperative pain [26]. The higher satisfaction rate in patients receiving MMI in our study may also be a consequence of the reduced anxiety and resultant reduction in pain perception.

Some limitations can be stated regarding this study. Detailed hemodynamic data were not recorded during the D&C procedure; thus could not be compared among women receiving MMI or conventional written information before the D&C. In addition, the association between perioperative anxiety and the hemodynamic parameters could not be studied. However, we consider that presence of severe hemodynamic alterations during the surgery would either lead to dizziness and lightheadedness or palpitation and would consequently influence patients' satisfaction. Given the high satisfaction rate in the MMI group, we speculate that no significant hemodynamic alterations has occurred in the MMI group during the D&C. AS another source of limitation, we only enrolled patients undergoing D&C for abnormal uterine bleeding. Further research, including patients with other indications for D&C, may be required to address the role of the MMI in D&C clearly.

Conclusion

The present study shows that the implementation of MMI before the D&C procedure is associated with less anxiety, less severe postoperative pain, and improved patients satisfaction, compared to the conventional written information. We suggest that MMI enables a better understanding of the procedure and consequently prepares the patient to cope with the consequences of the forthcoming intervention.

Ethics Committee Approval: The Kanuni Sultan Suleyman Training and Research Hospital Clinical Research Ethics Committee granted approval for this study (date: 19.07.2019, number: KAEK/2019.07.188).

Informed Consent: Written informed consent was obtained from the patient for the publication of the study.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Authorship Contributions: Concept – GY; Design – GY; Supervision – ZS; Fundings – NA; Materials – AA; Data collection and/or processing – NK; Analysis and/or interpretation – DOO; Literature review – IO; Writing – GY; Critical review – GY.

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