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The Effect of Video-Assisted Clean Intermittent Catheterization Training on Patients' Practical Skills and Self-Confidence

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Purpose: This research was carried out in order to examine the effect of clean intermittent catheterization (CIC) training with a video developed by the researchers on patients' ability to practice CIC and self-confidence.
Methods: The population of the study consisted of patients who had just started performing CIC in the urology polyclinic of a city hospital in Istanbul. The sample consisted of a total of 80 patients, 40 of whom were in the experimental group and 40 in the control group. The experimental group patients were given CIC training with a training video that was downloaded to the mobile phone of the patient, a family member, or caregiver. The patients' practice skills were evaluated by 2 independent observers. The DISCERN Inquiry Form and the Global Quality Score, the Patient Information Form, the CIC Skill Checklist and the Self-Confidence Scale in Clean Intermittent Self-Catheterization were used to collect data.
Results: In the experimental group, consisting of patients who received video-assisted training, the mean scores for the CIC Skill Checklist and the Self-Confidence Scale in Clean Intermittent Self-Catheterization were statistically significantly higher than in the control group ($P < 0.001$), the experience of feeling pain during catheterization was less than in the control group, and the patients in the experimental group experienced statistically significantly fewer complications such as urinary tract infections, urgency, urinary incontinence, hematuria and urethral stricture ($P < 0.05$).
Conclusions: Video-assisted CIC training had a positive effect on patients' practical skills and self-confidence.

Keywords: Intermittent urethral catheterization; Video-assisted training; Practice skill; Self concept; Nursing

- **Research Ethics:** The study was approved by the Ethics Committee of Okmeydani Training and Research Hospital (number:1494).
- **Conflict of Interest:** No potential conflict of interest relevant to this article was reported.

INTRODUCTION

Clean intermittent catheterization (CIC) is preferred over long-term indwelling catheterization for urinary excretion in patients who develop bladder dysfunction for various reasons [1,2]. CIC is accepted as a safe and effective method that supports the maintenance of bladder function, positively affects the individual's body image and self-confidence, and ensures urinary excretion in individuals with neurogenic bladder. Nurses play an important role in providing the patient or caregiver with practical CIC skills in the hospital or home care context in line with their contemporary roles and responsibilities within the healthcare team [3].

CIC education supports patients to perform CIC correctly and safely by increasing their level of knowledge and skills for CIC application and helps them adapt to the lifestyle changes associat-

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ed with CIC application [4,5]. Improper practice of CIC results in complications such as pain, urinary tract infection, urethral trauma, hematuria, and urethral stricture [6,7]. This negatively affects individuals' motivation to adhere to treatment and diminishes their quality of life. For this reason, it is very important for individuals to gain correct and safe practical skills [3,8].

Individual differences are an important factor affecting the way an individual learns knowledge. For this reason, appropriate learning methods should be determined and taken into account when planning education [9]. As verbal education models, written materials and multimedia-based education (videos, DVDs, internet, etc.) are among the methods used in patient education [10]. Video-assisted education, which has been used frequently in patient education in recent years, provides visual and auditory learning and creates integrity of meaning, thereby facilitating learning, especially for practical skills [11-13]. Videos guide the practices performed by patients in an environment away from the clinic, independently or together with caregivers, and also have the advantages of being able to be watched repeatedly and providing convenient learning to individuals with limited health literacy [10].

Self-confidence, which has been defined as the state of recognizing one's own talent and being aware of one's emotions, increases the learning and adaptation of newly learned skills and enhances an individual's ability to practice a skill independently [14]. CIC can be perceived as a difficult treatment method as it requires the patient to perform catheterization 4-6 times a day, which can cause fear, embarrassment, and anxiety. These emotions can lead to a decrease in self-confidence. Determining the self-confidence of the individual regarding CIC application and supporting it when necessary is a prerequisite for successful implementation. It is also very important to continue counseling and follow-up after discharge, along with education, to increase patients' self-confidence [3,14].

Few studies in the international literature have described video-based training on CIC skill acquisition, no Turkish studies on video training tools for CIC, and no studies examining the effects of video education on patients' practice skills and self-confidence. Therefore, this study was planned to evaluate the effect of video-based patient education on the patients' ability to practice CIC and self-confidence, using a CIC training video prepared in line with international guidelines on the subject.

The hypotheses of the study were as follows:

Hypothesis 1: Patients who received video-assisted training would have higher practical CIC skills than those who did not.

Hypothesis 2: The mean scores of the Self-Confidence Scale in Clean Intermittent Self-Catheterization would be higher in patients who received video-assisted training than in those who did not.

Hypothesis 3: Patients who received video-assisted training would be less likely to feel pain during catheterization than those who did not.

Hypothesis 4: The incidence of complications (urinary tract infections, very frequent urgency, urinary incontinence, hematuria, or urethral stricture) would be lower in patients who were given video-assisted training than in those who were not.

MATERIALS AND METHODS

Study Design

This research was carried out as a nonrandomized controlled trial in order to examine the effects of CIC training with a video prepared by the researchers on patients' practical skills and self-confidence.

Sample

The research was carried out at the urology outpatient clinic of a city hospital in Istanbul between September 2020 and July 2021. The population of the study consisted of patients who were seen at the urology outpatient clinic and had just started CIC application. The sample size of the study was calculated based on a power analysis. Assuming 80% power and a 5% type I error, taking into account the study by Silva et al. [3], 78 patients (n = 39 patients for each group) were found to be sufficient. The study was carried out with a total of 80 patients, including 40 each in the experimental and control groups, who met the inclusion criteria. The criteria for inclusion in the study were that the patients were 18 years of age or older, 65 years of age or younger, had just started CIC, had no upper extremity coordination disorders, had no visual, auditory, cognitive or perceptual disabilities, had no communication problems, and volunteered to participate in the study. The exclusion criteria were a urinary tract infection, initiation of permanent catheterization, and hospitalization for different reasons.

Data Collection Tools

Data were collected using the DISCERN Inquiry Form and Global Quality Score (GQS) for the preparation stage of the

video and the Patient Information Form, the CIC Skills Checklist, and the Self-Confidence Scale in Clean Intermittent Self-Catheterization for the study itself.

DISCERN inquiry form

This form, which was developed by Charnock et al. [15] for DISCERN to evaluate the reliability and quality of written information about treatment options for patients or information providers, was later adapted by Singh et al. [16] to evaluate the reliability of educational videos developed in the field of health. In the form consisting of 5 items, a "yes" answer given for each item is evaluated as 1 point. The scores that can be obtained from the DISCERN inquiry form are between 0 and 5. Videos with a total score of more than 3 are interpreted as high quality and contain useful information for the patient, videos with a total score of 3 are of medium quality and require additional information sources, and videos with a total score of less than 3 are of poor quality and should not be used by patients.

Global quality score

This evaluation form was developed by Bernard et al. [17] to examine the flow and quality of training videos, as well as the ease of use of the information provided for the patient. The form has 5 items that evaluate the quality of a video (1, low quality; 2, low quality - limited use; 3, somewhat useful; 4, useful; 5, useful - excellent quality). In the evaluation, the element that best expresses the quality of the video is selected.

Patient information form

This form was prepared by the researcher in light of the literature in order to determine the factors affecting the patients' CIC-related problems [18,19]. The Patient Information Form consisted of questions to determine individual characteristics and features that may affect CIC performance.

CIC Skills Checklist

The CIC Skills Checklist was prepared by the researcher in accordance with the European Association of Urology Nurses (EAUN) [6] and Society of Urologic Nurses and Associates (SUNA) [20] practice guidelines to evaluate skill development in patients who perform CIC. The checklist, which is similar to the content of the video consisting of CIC implementation steps, was assessed based on the opinions of 9 experts in order to ensure its scope and content validity. Expert opinions were evaluated with the content validity index (CVI), and the CVI value was found to be 0.90. The checklist consists of a total of 11 items, including the application steps. The catheterization application skills of the patients are evaluated as "yes" or "no" according to the correctness of the answers. In the scoring of the checklist, in line with the expert opinion, a "yes" answer was scored as 1 point, a "no" answer was scored as 0 points, and the range of points that could be obtained from the checklist was 0 to 11. A higher score indicated a higher level of CIC skill.

Self-Confidence Scale in Clean Intermittent Self-Catheterization

The scale was developed by Biaziolo et al. [14] to assess the self-confidence of patients applying CIC. This scale was adapted to Turkish society by Culha and Acaroğlu [21]. The scale, which is a 5-point Likert type (0, not sure; 1, slightly confident; 2, confident; 3, very confident; 4, completely sure), consists of a total of 16 items and does not contain subdimensions. The score ranges from 0 to 64, with 64 points interpreted as "completely confident," 48–63 points as "very confident," 32–47 points as "confident," 16 to 31 points as "less confident," and 15 or fewer points as "not sure." A high score indicates high self-confidence, and a low score indicates low self-confidence. The Cronbach alpha coefficient was 0.94 for the original scale, 0.89 in the study where the scale was adapted to the Turkish population, and 0.96 in this study.

Preparation of the CIC Skills Video and Written Material (Training Brochure)

The video training content and training brochure were created by the researcher in line with the EAUN and SUNA guidelines. In addition to the information contained in the CIC training video, the training brochure, which was created in the form of visuals and written text, included additional information (fluid and nutritional intake, information for out-of-home practice, etc.). The prepared video training content and the CIC training brochure were assessed based on the opinions of 9 experts. When expert opinions were examined, the CVI for the video training content was 0.90 and the CVI for the training brochure was 0.76. With the training content, which was finalized in line with the suggestions of the experts, the "urinary catheterization model" was applied to female and male models in the laboratory environment, in line with the application steps determined by the researchers, and the recording of the training video was completed (Fig. 1A–C). The duration of the training video was 4.22 minutes for female patients and 4.37 minutes for male patients. The reliability, flow, and quality of the training videos were evaluated by the same experts using the DISCERN Inqui-

Fig. 1. Catheterization procedure. (A) The necessary materials for catheterization were prepared. (B) In women, the labia were separated and wiped from top to bottom in one go. (C) During withdrawal of the catheter, after waiting until the urine flow started again, the catheter was slowly completely removed when the urine flow was completely finished.

ry Form and GQS. Based on the experts' opinions, the mean DISCERN Inquiry Form and GQS scores were 4.00 and 5.00, respectively, for both the female and male educational videos. After it was decided that the training videos were valid and reliable, 10 patients who had been performing CIC for at least 6 months evaluated the videos using the same forms, and it was decided that the videos and the CIC Skill Checklist were valid and reliable for use in education.

Data Collection

Patients who met the inclusion criteria and volunteered to participate in the study were assigned to the groups. In order to prevent the patients in the control and experimental groups from being affected by each other, the data were first collected from the control group patients. Patient interviews and training were carried out in the urodynamics room, where the patient's privacy could be ensured and CIC could be performed. The study was performed in collaboration with a specialist physician who worked as an independent observer at the institution where the research was conducted and was responsible for the treatment of all patients who underwent CIC. The practice skills of the patients were evaluated independently by the main researcher and the collaborating physician. The same specialist provided support for evaluating the presence of complications in the patients. The patients were evaluated 4 times. In the first interview, where the raw data were obtained (pretest), the patients in both groups received the verbal CIC training that was included in routine practice, which was given by the physician for approximately 20 minutes. Then, the patient was asked to perform CIC application, and the patient's application skill was evaluated by 2 independent observers with the CIC Skill Checklist. The patient was asked to answer the Self-Confidence Scale in Clean Intermittent Self-Catheterization. No intervention was applied to the patients in the control group. CIC application was explained to the patients in the experimental group by the researcher via a computer, iPad, and smartphone with a training video, the video was uploaded to the mobile phone of the patient or his/her caregiver, and the patient's questions were answered. The patient was asked to watch the video before each application for 3 months until he or she felt competent with the information described and shown in the training video. When the patient had a problem with any of the application steps, he or she was asked to watch the video again after the application. Before the next interview, patients were reminded to watch the video twice a week by phone or text message and their questions were answered (Fig. 2). The patients in both groups were followed up in the first week and the first month, the final evaluation (posttest) was performed in the third month, and training for the skills that were not applied by the patient was repeated in the evaluation of the CIC Skills Checklist. The checklist was evaluated by the main researcher (first observer) and the collaborating urologist (second observer). The interobserver kappa values for the evaluation of patients' ability to perform CIC were between 0.89 and 0.96 in both the experimental and control groups. It was evaluated whether the patients had pain during the application, whether they had visible hematuria, and whether they had episodes of urinary incontinence and urgency, with yes/no responses. Considering the difficulty of placing the catheter, the presence of urethral stricture was determined according to the evaluation carried out by the physician.

Ethical Considerations

The study was approved by the Ethics Committee of Okmeydani Training and Research Hospital (number: 1494). Before the application of the research, the patients who would be included in the research were informed about the purpose of the research, how the research would be carried out, and how their

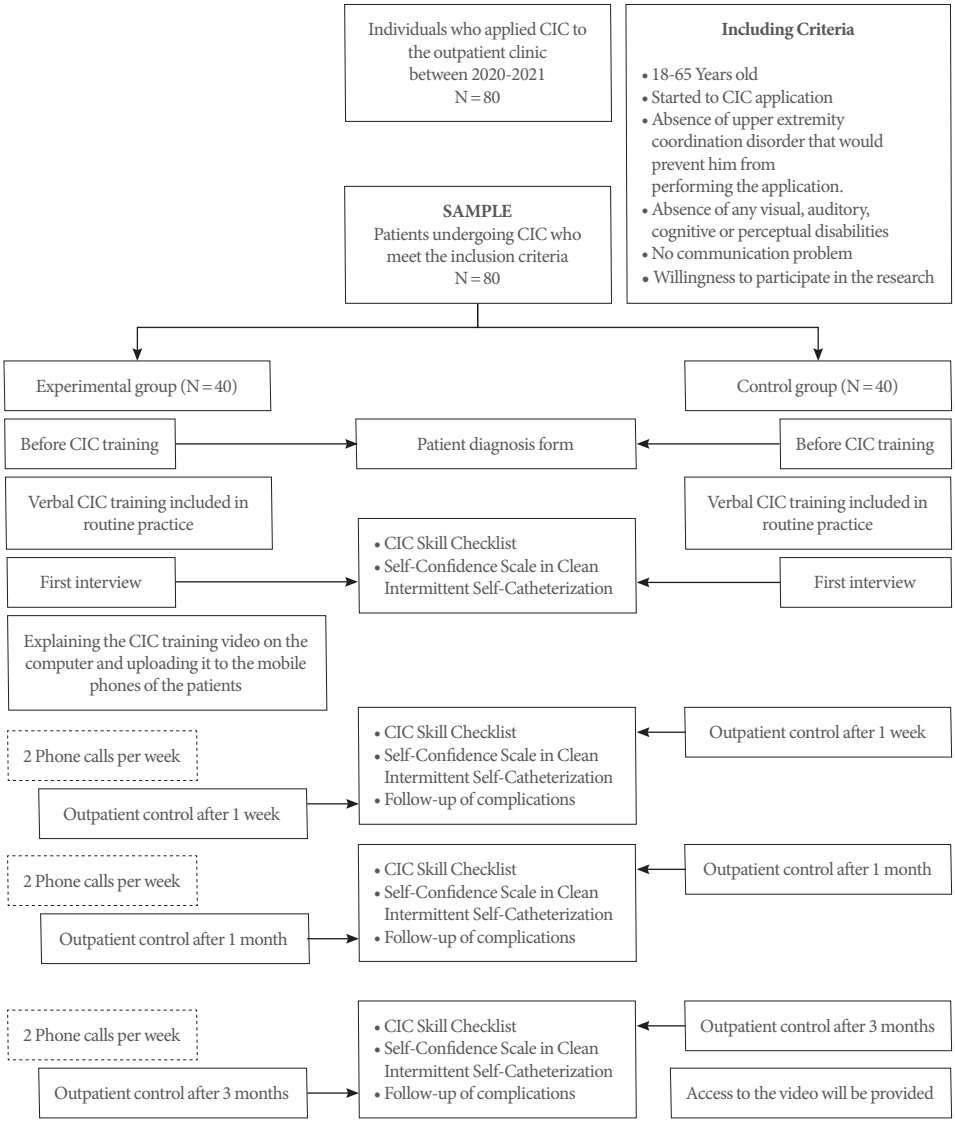

Fig. 2. Research design. CIC, clean intermittent catheterization.

personal information would be stored. Verbal and written consent were obtained in line with the principle of voluntariness. After the final evaluation, in line with the principle of equality, the control group also had access to the training video.

Statistical Analysis

The data obtained from the research were analyzed using IBM SPSS Statistics ver. 21.0 (IBM Co., Armonk, NY, USA). The homogeneity of the data was determined using the Kolmogorov-Smirnov test. To evaluate the individual and disease-related characteristics of the participants; descriptive analyzes (arithmetic mean, standard deviation, minimum-maximum, percentile) were conducted. The Student t-test was used to compare patients' mean CIC Practice Skill scores and mean scores on the Self-Confidence Scale in Clean Intermittent Self-Catheterization. Complications were evaluated using the chi-square test. The Wilcoxon test and Friedman test were used to evaluate the status of patients between follow-ups. To assess agreement between 2 independent observers, the Cohen kappa test was used to analyze variability based on time within and between groups, and the Friedman test was performed with the Wilcoxon signed rank test. The results were evaluated using 95% confidence intervals, at the $P < 0.05$ significance level.

RESULTS

Individual and Disease-Related Characteristics of Patients

Participants' mean age was 49.14 ± 14.47 years, 58.8% were women, 81.3% were married, 47.5% were primary school graduates, and 48.8% were housewives. The indication for CIC was neurogenic bladder in 70% of patients, and 87.5% of them did not have any chronic disease other than this indication. The

Table 1. Distribution of patients' individual and disease-related characteristics (N = 80)

Variable	Control group (n = 40)	Experimental group (n = 40)	Total	P-value
Age (yr)				0.535 (1.344‡)
Mean ± SD	48.13 ± 15.12	50.15 ± 13.90	49.14 ± 14.47	
Range	23–72	19–73	19–73	
Sex				0.364 (1.289†)
Female	26 (65.0)	21 (52.5)	47 (58.8)	
Male	14 (35.0)	19 (47.5)	33 (41.2)	
Marital status				0.500 (0.082†)
Married	32 (80.0)	33 (82.5)	65 (81.2)	
Single	8 (20.0)	7 (17.5)	15 (18.8)	
Educational level				0.785 (1.759†)
Primary school	19 (47.5)	19 (47.5)	38 (47.5)	
Secondary school	5 (12.5)	2 (5.0)	7 (8.7)	
High school	8 (20.0)	11 (27.5)	19 (23.8)	
Undergraduate	8 (20.0)	8 (20.0)	16 (20.0)	
Profession				0.120 (2.566†)
Private	8 (20.0)	10 (25.0)	18 (22.5)	
Retired	9 (22.5)	14 (35.0)	23 (28.7)	
Housewife	23 (57.5)	16 (40.0)	39 (48.8)	
CIC application ındication				0.280 (5.364†)
Spinal cord ınjury neurogenic bladder	8 (20.0)	5 (12.5)	13 (16.2)	
Spina bifida	29 (72.5)	27 (67.5)	56 (70.0)	
Multiple sclerosis	1 (2.5)	0 (0)	1 (1.3)	
Spinal cord ınjury	2 (5.0)	8 (20.0)	10 (12.5)	
Chronic disease				0.865 (1.276†)
Yes	4 (10.0)	6 (15.0)	10 (12.5)	
No	36 (90.0)	34 (85.0)	70 (87.5)	
How many times per day CIC is applied				0.598 (0.543‡)
Mean ± SD	5.10 ± 0.982	5.23 ± 1.07	5.16 ± 1.02	
Range	4–7	3–6	3–7	
Type of catheter, hydrophilic	40 (100)	40 (100)	80 (100)	0.765 (0.657‡)
Needing help performing activities of daily living				0.586 (0.672†)
No	30 (75.0)	33 (82.5)	63 (78.8)	
Yes	10 (25.0)	7 (17.5)	17 (21.2)	

Values are presented as number (%) unless otherwise indicated.
SD, standard deviation; CIC, clean intermittent catheterization.
†Chi-square test. ‡Student t-test.

Table 2. Patient's mean scores for practical clean intermittent catheterization skills (N = 80)

Group	1st ınterview (a)	1st week (b)	1st month (c)	3rd month (d)	P-value[a)]
Control	7.15 ± 2.21	7.38 ± 2.16	7.60 ± 2.62	7.42 ± 2.02	0.08 (10.60[†])
Experimental	6.95 ± 2.06	9.0 ± 1.49	10.28 ± 0.93	10.77 ± 0.42	< 0.001 (79.20[†]) d = c > b > a[‡]
P-value[b)]	0.677 (0.418[§])	< 0.001 (-3.925[§])	< 0.001 (-6.084[§])	< 0.001 (-10.246[§])	

Values are presented as mean ± standard deviation.
[†]Friedman test. [‡]Wilcoxon ranks test. [§]Student t-test. [a)]Intragroup comparison. [b)]Comparison between groups.

Table 3. Patients' mean scores on the Self-Confidence Scale in Clean Intermittent Self-Catheterization (N = 80)

Group	1st ınterview (a)	1st week (b)	1st month (c)	3rd month (d)	P-value[a)]
Control	7.15 ± 2.21	7.38 ± 2.16	7.60 ± 2.62	7.42 ± 2.02	0.08 (10.60[†])
Experimental	6.95 ± 2.06	9.0 ± 1.49	10.28 ± 0.93	10.77 ± 0.42	< 0.001 (79.20[†]) d > c > b > a[‡]
P-value[b)]	0.677 (0.418[§])	< 0.001 (-3.925[§])	< 0.001 (-6.084[§])	< 0.001 (-10.246[§])	

Values are presented as mean ± standard deviation.
[†]Friedman test. [‡]Wilcoxon ranks test. [§]Student t-test. [a)]Intragroup comparison. [b)]Comparison between groups.

mean frequency of CIC application during the day was 5.16 ± 1.02, and all patients used hydrophilic catheters. Furthermore, 21.3% of the patients stated that they did not need help while performing activities of daily living. In the statistical analysis, no significant differences were found between the control and experimental groups in terms of individual and disease-related characteristics. The Kolmogorov-Smirnov test showed that the demographic data were homogeneously distributed between the control and experimental groups (P > 0.05) (Table 1).

Patients' Practical CIC Skills

No statistically significant difference was found in the mean CIC Skill Checklist scores in repeated evaluations in the control group patients (P > 0.05) (Table 2). The mean CIC Skill Checklist score increased gradually from the first assessment to the third assessment in the experimental group (P < 0.001), while the third and fourth assessments were very close to each other. The mean CIC Skill Checklist scores of the patients in the experimental group, who received video-assisted CIC training, were higher than those of the patients in the control group, with a statistically significant difference starting from the first-week evaluation (P < 0.001) (Table 2).

Patients' Mean Scores on the Self-Confidence Scale in Clean Intermittent Self-Catheterization

No significant within-group differences were found in the mean scores of the Self-Confidence Scale in Clean Intermittent Self-Catheterization in the control group (P > 0.05). However, in the experimental group, the mean scores of the Self-Confidence Scale in Clean Intermittent Self-Catheterization increased gradually from the first week to the third month after the first interview, at a statistically significant level (P < 0.001) (Table 3). In the experimental group patients, who received video-assisted CIC training, the mean scores of the Self-Confidence Scale in Clean Intermittent Self-Catheterization were higher than the patients in the control group, with statistically significant differences in the evaluations after the first interview (P < 0.001) (Table 3).

Comparison of Complications of CIC in Patients

In a between-group comparison of the presence of CIC complications in repeated evaluations, in the third-month evaluations, the patients in the experimental group had less pain during the catheterization procedure (P = 0.042), fewer urinary tract infections (P = 0.006), less urgency (P = 0.008), and less hematuria (P = 0.001), reflecting statistically significant differences compared to the patients in the control group. No statistically significant difference was found between the groups in the development of urethral stricture (P > 0.05). In the first week (P = 0.008) and the third month (P = 0.047), urinary incontinence was less common in the experimental group patients, who received video-assisted CIC training, than in the control group

Table 4. Comparison of complications of clean intermittent catheterization between groups (N = 80)

Complications	Group	1st ınterview (a)	1st month (b)	3rd month (c)	P-value[a)]
Feeling pain during catheterization application	Control	18 (45)	15 (37.5)	10 (25)	0.03 (7.021†) (a > b = c‡)
	Experimental	20 (50)	8 (20)	6 (15)	< 0.001 (22.933†) (a > b = c‡)
	χ^2	0.201†	2.990†	1.250†	
	P-value[b)]	0.823	0.069	0.042	
Urinary system ınfection	Control	11 (27.5)	18 (45)	12 (30)	0.179 (3.440†)
	Experimental	14 (35)	12 (30)	2 (5)	0.006 (10.333†) (a = b > c)
	χ^2	524†	1.920†	8.658†	
	P-value[b)]	0.63	0.248	0.006	
Urgency	Control	10 (25)	13 (32.5)	6 (15)	0.055 (6.730†)
	Experimental	11 (27.5)	9 (22.5)	1 (2.5)	0.001 (14.00†) (a = b > c)
	χ^2	0.065†	1.003†	3.914†	
	P-value[b)]	1.000	0.453	0.008	
Urinary ıncontinence	Control	19 (47.5)	11 (27.5)	8 (20)	0.001 (13.857†) (a > b = c)‡
	Experimental	7 (17.5)	9 (22.5)	2 (5)	0.06 (6.005†)
	χ^2	8.205†	0.267†	4.114†	
	P-value[b)]	0.008	0.797	0.047	
Hematuria	Control	16 (40)	17 (42.5)	13 (32.5)	0.420 (1.733†)
	Experimental	13 (32.5)	12 (30)	1 (2.5)	0.004 (11.083†) (a = b > c)
	χ^2	0.487†	1.352†	12.468†	
	P-value[b)]	0.647	0.352	0.001	
Urethral stricture	Control	0	5 (12.5)	9 (22.5)	0.001 (13.556†) (c > b > a)‡
	Experimental	0	4 (10)	1 (2.5)	0.072 (5.250†)
	χ^2	N/A	0.125†	1.385†	
	P-value[b)]	N/A	1.000	0.378	

Values are presented as number (%).
N/A, not available.
†Friedman test. ‡Wilcoxon ranks test. [a)]Intragroup comparison. [b)]Comparison between groups.

(Table 4).

DISCUSSION

It is important that patients have sufficient knowledge and skills to reduce and prevent complications by performing CIC independently, safely, and effectively. Nurses play a very important role in the development of practical skills and self-confidence of patients who will apply CIC through educational practice [3,21]. In recent years, the benefits of using training videos, which are known to have a positive effect in transforming knowledge into practice and behavior, as well as gaining knowledge by combining theory and practice in patient education, have been emphasized [22-24]. In light of this information, this study was carried out as a nonrandomized controlled trial to examine the effects of a CIC training video prepared by the researcher in line with international guidelines and video-assisted CIC training on patients' ability and self-confidence.

The lack of significant differences in individual and disease characteristics of the patients showed that similarity was achieved between the control and experimental group patients. The mean scores of the CIC Skills Checklist in the experimental group patients were significantly higher than those of the patients in the control group from the first week onward ($P < 0.001$) (Table 2). Therefore, video-assisted training accelerated the development of CIC practice skills by supporting cognitive, affective, and psychomotor learning areas in patients, and the video prepared by the researchers was an effective training tool. Although no study in

the literature has examined the effect of video-assisted CIC training on patients' practical skills, studies evaluating the validity of CIC training videos have shown that these videos can contribute to the education of patients and their compliance with catheterization [22,23]. In video-assisted trainings on other diseases, the videos provide visual and auditory learning and have a positive effect on transforming knowledge into practice and behavior by combining theory and practice [4,24-27].

A comparison of the mean scores of the Self-Confidence Scale in Clean Intermittent Self-Catheterization obtained by repeated evaluations of the groups showed that the self-confidence of the patients in the experimental group, who received video-assisted CIC training, was significantly higher than that of the patients in the control group ($P < 0.001$) (Table 3). In light of the literature, it is expected that self-confidence will increase with the individual's ability to apply after CIC training [3]. However, this rapid increase in the self-confidence scores of the experimental group patients, who received video-assisted CIC training, can be explained by the fact that video-assisted CIC training is more effective than other training methods. This finding is consistent with the results of prior research examining the effect of video-assisted training on the self-confidence and self-efficacy of patients with different diseases and in different applications [28,29].

An analysis of the presence of CIC complications based on repeated evaluations found that in the third-month evaluations, complications such as feeling pain, urinary tract infections, urgency, urinary incontinence, and hematuria during catheterization were less common in the experimental group patients, who received video-assisted training, than in the control group ($P < 0.05$) (Table 4). Although CIC is an effective and reliable treatment method for maintaining bladder function, it causes many complications if it is not applied correctly and frequently enough. Urinary tract infections, urinary incontinence, hematuria, urethral trauma, and urethral stricture are among the most common complications [2,6,7].

According to the literature, urethral trauma, pain, hematuria and urethral stricture are closely related to each other, and urethral trauma can damage the mucosa and cause hematuria, pain, urinary tract infections, and narrowing in the urethral stricture in the long term [1,6,30,31]. The use of a hydrophilic catheter and lubricating gel is effective in preventing and reducing these complications, as well as performing CIC correctly and safely [1,32]. Failure to perform catheterization in accordance with the principles of asepsis results in excessive fluid intake, insufficient catheterization, or an inability to completely empty the urine from the bladder, and the increase in the residual urine volume in the bladder increases the risk of urinary tract infections [2,6,33]. Urinary incontinence in patients performing CIC is usually seen due to the development of bladder distension as a result of a long interval or insufficient frequency between catheterizations [1,34]. In the international CIC practice guidelines, it is recommended to perform catheterization 4–6 times a day. The CIC application frequency of the patients included in the study was 5.16 ± 1.02 times a day on average, which is consistent with that recommendation. Thus, these findings support the greater effectiveness of video-assisted training than verbal education in performing the application in accordance with the principles of asepsis and in emptying the bladder completely. In order to develop correct practical skills and reduce the risk of complications, regular follow-ups are required, and it is recommended to repeat the training for skills that the patient does not perform correctly during these follow-ups [1,6,35]. The statistically significant difference detected in the development of complications shows that, in addition to the practical skills gained with video-assisted training, telephone counseling after the first interview and 3 patient follow-ups are effective.

Video-assisted education helped the patients in the experimental group to acquire practical skills early through the inclusion of visual and auditory stimuli, allowing repeat viewing and being a role model, and it was important for the patients to transform their knowledge into the desired behavior by observing and adopting it. In addition, the trainings provided through these videos, which were prepared in line with national and international guidelines in order to present the relevant knowledge and skills, are also important in terms of including evidence-based practices in patient care and improving patient outcomes.

Since this study was conducted only with patients who applied CIC in the urology outpatient clinic of a training and research hospital, the limitations of the study are that the findings are difficult to generalize, the patients were not followed up for more than 3 months, and the literature on the subject is limited in discussing the research results. The lack of a definition of the type of urinary tract infections is another limitation of the study.

In conclusion, video-assisted CIC training had a positive effect on patients' practical skills and self-confidence development. In light of these results, it may be recommended to pro-

vide trainings with videos prepared in line with national and international guides in CIC training and to perform follow-ups at regular intervals in order to ensure that patients develop safe and correct application skills, and to reduce the risk of complications. It is also suggested that application skills should be evaluated in line with a checklist and that training should be repeated for skills that were not applied correctly by the patient during follow-ups. Additionally, further studies should be conducted to determine the effect of video-assisted CIC training on practice skills and self-confidence in different sample groups.

AUTHOR CONTRIBUTION STATEMENT

· Conceptualization: *YC, RA*
· Data curation: *YC*
· Formal analysis: *RA*
· Methodology: *YC, RA*
· Project administration: *YC, RA*
· Visualization: *YC, RA*
· Writing-original draft: *YC*
· Writing-review & editing: *YC, RA*

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REFERENCES

1. Newman DK, New PW, Heriseanu R, Petronis S, Håkansson J, Håkansson MÅ, et al. Intermittent catheterization with single- or multiple-reuse catheters: clinical study on safety and impact on quality of life. Int Urol Nephrol 2020;52:1443-51.
2. Newman DK, Willson MM. Review of intermittent catheterization and current best practices. Urol Nurs 2011;31:12-28, 48; quiz 29.
3. Silva DRA, Mazzo A, Jorge BM, Souza Júnior VD, Fumincelli L, Almeida RGS. Intermittent urinary catheterization: the impact of training on a low-fidelity simulator on the self-confidence of patients and caregivers. Rehabil Nurs 2017;42:97-103.
4. Abu Abed M, Himmel W, Vormfelde S, Koschack J. Video-assisted patient education to modify behavior: a systematic review. Patient Educ Couns 2014;97:16-22.
5. Dekkers T, Melles M, Groeneveld BS, de Ridder H. Web-based patient education in orthopedics: systematic review. J Med Internet Res 2018;20:e143.
6. Vahr S, Cobussen-Boekhorst H, Eikenboom J, Geng V, Holroyd S, Lester M, et al. Evidence based guidelines for best practice in urological health care: catheterisation urethral intermittent in adults: dilatation, urethral intermittent in adults [Internet]. Arnhem (Netherlands): European Association of Urology Nurses; 2013 [cited 2022 Mar 7]. Available from: https://nurses.uroweb.org/guideline/catheterisation-urethral-intermittent-in-adults/.
7. Cutting D, Robbs L, Sommerey L, Joachimides N, Carr M, Simao Amaral N, et al. Clean intermittent urethral catheterization in adults. Canadian best practice recommendations for nurses [Internet]. Canada: Nurses Specialized in Wound, Ostomy and Continence Canada, Canadian Nurse Continence Advisors, Urology Nurses of Canada, and Infection Prevention and Control Canada; 2020 [cited 2022 Mar 7]. Available from: https://ipac-canada.org/photos/custom/Members/pdf/Clean-Intermittent-Urethral-Catheterization-Adults-for-Nurses-BPR-May2020.pdf.
8. Assis GM, e Faro AC. Clean intermittent self catheterization in spinal cord injury. Rev Esc Enferm USP 2011;45:289-93. Portuguese.
9. Shepherd JD, Badger-Brown KM, Legassic MS, Walia S, Wolfe DL. SCI-U: e-learning for patient education in spinal cord injury rehabilitation. J Spinal Cord Med 2012;35:319-29.
10. Yildiz T. Cerrahi hasta eğitiminde kullanılan güncel yöntemler: Hastalık merkezli değil, hasta merkezli eğitim. MÜSBED 2015;5:129-33.
11. Mather C, Cummings E. Unveiling the mobile learning paradox. Stud Health Technol Inform 2015;218:126-31.
12. Kristiansen TM, Antoft R. Patient education as a status passage in life-An ethnographic study exploring participation in a Danish group based patient education programme. Soc Sci Med 2016;158:34-42.
13. Mackay BJ, Anderson J, Harding T. Mobile technology in clinical teaching. Nurse Educ Pract 2017;22:1-6.
14. Biaziolo CFB, Mazzo A, Martins JCA, Jorge BM, Batista RCN, Tucci SJ Júnior. Validation of self - confidence scale for clean urinary intermittent self - catheterization for patients and health - caregivers. Int Braz J Urol 2017;43:505-11.
15. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: An instrument for judging the quality of written consumer health information on treatment choices. J Epidemiol Community Health 1999;53:105-11.
16. Singh AG, Singh S, Singh PP. YouTube for information on rheumatoid arthritis--a wakeup call? J Rheumatol 2012;39:899-903.
17. Bernard A, Langille M, Hughes S, Rose C, Leddin D, Veldhuyzen van Zanten S. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. Am J Gas-

troenterol 2007;102:2070-7.
18. Woodward S, Rew M. Patients' quality of life and clean intermittent self-catheterization. Br J Nurs 2003;12:1066-74.
19. Fumincelli L, Mazzo A, Martins JCA, Henriques FMD, Cardoso D, Rodrigues MA. Quality of life of intermittent urinary catheterization users and their caregivers: a scoping review. Worldviews Evid Based Nurs 2017;14:324-33.
20. Donna Clar AJ, Lipsy S, Harris J, Morrison M. Adult clean intermittent catheterization [Internet]. Pitman (NJ): Society of Urologic Nurses and Associates (SUNA); 2006 [cited 2022 Mar 7]. Available from: https://www.suna.org/resources/adultCICGuide.pdf.
21. Çulha Y, Acaroglu R. Temiz Aralıklı Kendi Kendine Kateterizasyonda Özgüven Ölçeği Türkçe formunun geçerlik ve güvenirliği. Cukurova Med J 2020;45:1690-7.
22. Wilson M. Clean intermittent self-catheterisation: working with patients. Br J Nurs 2015;24:76, 78, 80 passim.
23. Lima MB, Rebouças CBA, Castro R, Cipriano MAB, Cardoso M, Almeida PC. Construction and validation of educational video for the guidance of parents of children regarding clean intermittent catheterization. Rev Esc Enferm USP 2017;51:e03273.
24. Faleiros F, Silveira L, Cucick C, Cordeiro A, Kappler C. Analysis of Brazilian videos for learning of bladder intermittent self-catheterization. Urol Nurs 2019;39:193-7.
25. Wang SY, Chang TH, Han CY. Effectiveness of a multimedia patient education intervention on improving self-care knowledge and skills in patients with colorectal cancer after enterostomy surgery: a pilot study. Adv Skin Wound Care 2021;34:1-6.
26. Akin Korhan E, Tokem Y, Uzelli Yilmaz D, Dilemek H. Hemşirelikte psikomotor beceri eğitiminde video destekli öğretim ve OSCE uygulaması: bir deneyim paylaşımı. İzmir Katip Çelebi Üniv Sağlık Bilimleri Fakültesi Dergisi 2016;1:35-7. Turkish.
27. Azak M, Mutlu B, Tamay Z. The effect of training of metered-dose inhaler technique on asthma control and quality of life in children with asthma: a randomized trial. Child Health Care 2021;50:44-63.
28. Halemani K, Shashidhara YN, D'Souza SRB. An evaluative study to assess the effectiveness of a video-assisted teaching module on knowledge and practice regarding home-based colostomy care of children among primary caregivers in selected hospital Lucknow, Uttar Pradesh. Indian J Surg Oncol 2021;12:146-51.
29. Reid KRY, Reid K, Esquivel JH, Thomas SC, Rovnyak V, Hinton I, et al. Using video education to improve outcomes in heart failure. Heart Lung 2019;48:386-94.
30. Sinha S, Dillon J, Dargar SK, Archambault A, Martin P, Frankel BA, et al. What to expect that you're not expecting: A pilot video education intervention to improve patient self-efficacy surrounding discharge medication barriers. Health Inform J 2019;25:1595-605.
31. Lamin E, Newman DK. Clean intermittent catheterization revisited. Int Urol Nephrol 2016;48:931-9.
32. Orlandin L, Nardi A, Costa R, Mazzo A. Difficulties of patients and caregivers in performing clean intermittent catheterization: scoping review. ESTIMA Braz J Enterostomal Ther 2020;15:e1520.
33. Rognoni C, Tarricone R. Intermittent catheterisation with hydrophilic and non-hydrophilic urinary catheters: systematic literature review and meta-analyses. BMC Urol 2017;17:4.
34. Vasudeva P, Madersbacher H. Factors implicated in pathogenesis of urinary tract infections in neurogenic bladders: some revered, few forgotten, others ignored. Neurourol Urodyn 2014;33:95-100.
35. Rantell A. Intermittent self-catheterisation in women. Nurs Stand 2012;26:61-2, 64, 66-8.
36. Turmel N, Hentzen C, Miget G, Chesnel C, Charlanes A, Le Breton F, et al. Urethral pain during clean intermittent self catheterization: retrospective analysis of 77 patients. Prog Urol 2019;29:360-5. French.