*Original article*

# Video-based versus educational booklet training on self-care performance of patients with cataract

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**Abstract**:

***Background and Objective***: Training patients can increase their knowledge and skills in self-care performance after cataract surgery. The present study compared the effect of video-based training and educational booklet methods on the self-care performance of patients with cataracts. ***Methods and Material***: In this interventional study,83eligible patients a day prior to their cataract surgery were enrolledin the study based on the convenient sampling method conducted in 2020.Then, the patients were allocated into a video-based training group (n= 40) and educational booklet (n=43) group by the permuted block random sampling method. The patients completed a researcher-made questionnaire one day before and one day after the intervention to be assessed for their knowledge and self-care performance after cataract surgery. Face as well as content validity (CVR = 0.99, CVI = 0.8) and reliability (0.839) of the data collection tool were confirmed. For statistical analysis, independent t-test and analysis of covariance were used, using SPSS16 software. ***Results and Discussion*:** Based on the results, video-based training and educational booklet had the same effect on increasing the level of knowledge among the patients. Also, the mean score of self-care performance was significantly higher in the video-based training compared to the booklet group after the intervention (P=0.014). ***Conclusion:*** Video-based training can significantly enhance patients'knowledge and self-care performance regarding cataract than training the patients via the educational booklet.

**Keywords:** Self-care; Booklet; instructional videos; cataract; performance

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## Introduction

Cataract is considered the most common cause of eye blindness around the world. More than tens of millions of cataract surgeries are performed each year in developed countries, including Iran, and about 95% of these operations are not associated with complications.[1],[2] Today, there is an increasing need in the health care system to train patient care at home for early discharge and perform surgical procedures on an outpatient to manage the complications, make appropriate care measures, and learn the correct use of the drugs.[3]Training cataract patients can increase their knowledge and skills in self-care, which results in preventing complications and decreasing the rate of re-hospitalization.[4] Self-care training for patients leads to early discharge and outpatient surgery.[5]Hence, developing self-care is an essential strategy for adapting patients to life events, managing stress, and enhancing their health. Studies revealed that training could be helpful to cataract patients before surgery to advance their knowledge

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and skills, leading to appropriate self-care activities. Furthermore, promoting self-care is one of the critical factors in faster recovery.[6, 7]

However, inadequate preoperative education can be a significant factor in preventing self-care. Different educational methods do not have the same effects, and it is necessary to evaluate their various products. Hence, selecting an appropriate training approach plays a significant role in learning and enhancing the patients' readiness for self-care.[8]Video-based learning by using audio, film, and animation can simulate the realworld, promoting patients' knowledge and skills for self-care behaviors. Educational videos can provide information about postoperative care for patients with different levels of education. They can also be effective in delivering step-by-step training and frequent reviews.[9] Moreover, some studies have shown that video-based training is an effective method for promoting self-care of patients with permanent heart pacemakers, reducing the level of anxiety in patients before surgery, encouraging self-efficacy of pregnant mothers, and increasing patients' knowledge about cholangitis.[10-14]

Another standard method to train patients on postoperative care is using educational booklets. Studies have shown that using an educational booklet effectively affectspatients' quality of life with myocardial infarction after recovery. Educational booklets are conventional methods for caring for patients undergoing cataracts to prevent possible

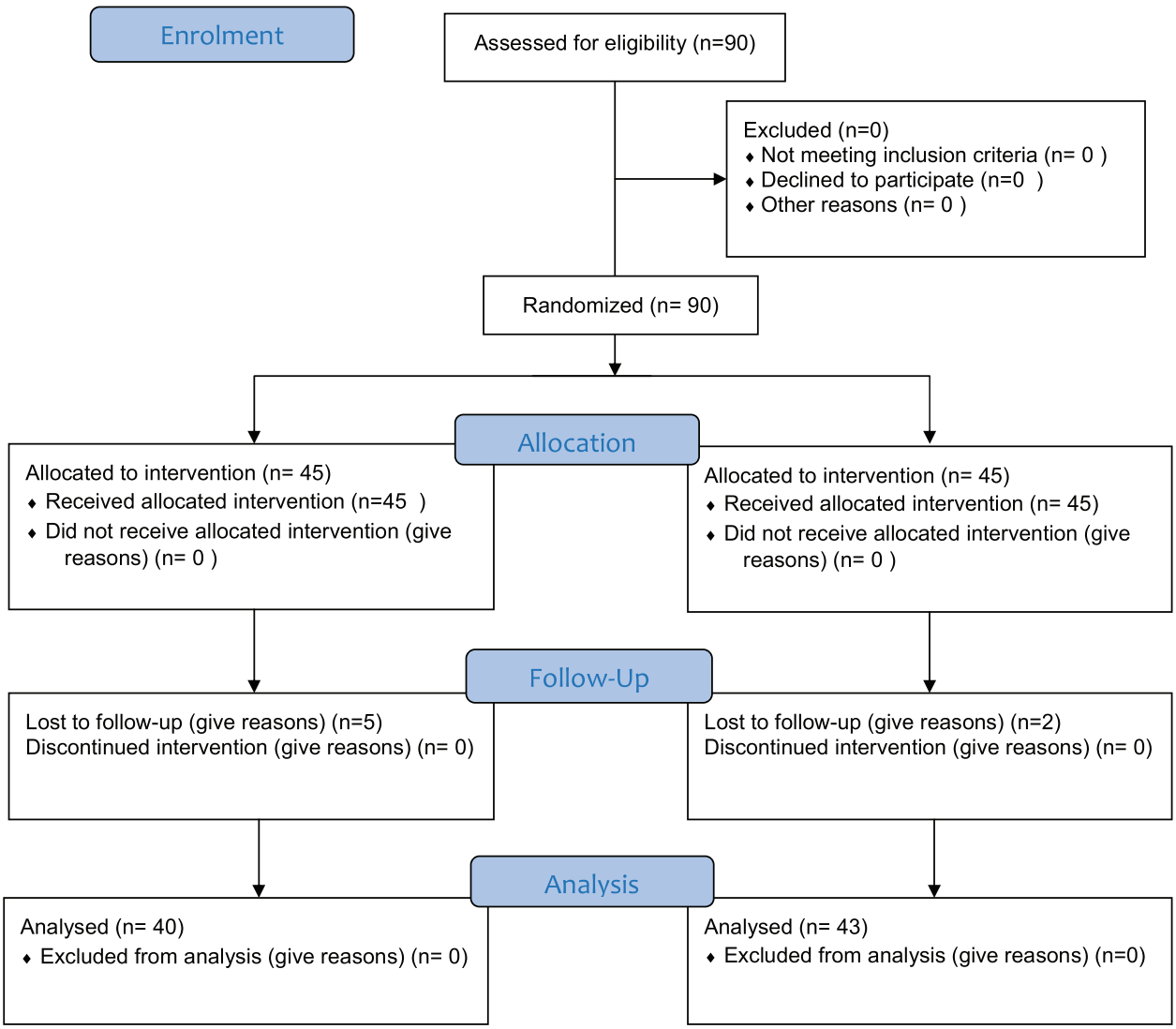


Fig. 1. The patient's recruitment flow diagram.

complications. However, due to visual impairment, there is a need for simultaneous verb training in many cases.[14] Thus, video-based training for patients with cataracts can be a valuable tool for training patients, which unfortunately is less emphasized in self-care training for patients with cataracts. Also, since no study has been conducted in this area at Shiraz University of Medical Sciences, the present study examined and compared the effects of video-based training and educational booklet on the self-care performance of patients with cataracts.

## Materials and methods

This pretest-posttestinterventional study was conducted with two intervention (educational video) and a control (educational booklet) groups. The study population consisted of cataract patients referring to Shiraz Binagostar Ophthalmology Clinic for some preoperative examination one day prior to surgery during July 2019- March 2020. Based on the results of a similar previous study[15] in which the effect size was 0.72 and considering a type I error rate of 0.05, power of 0.80 (using the following formula),

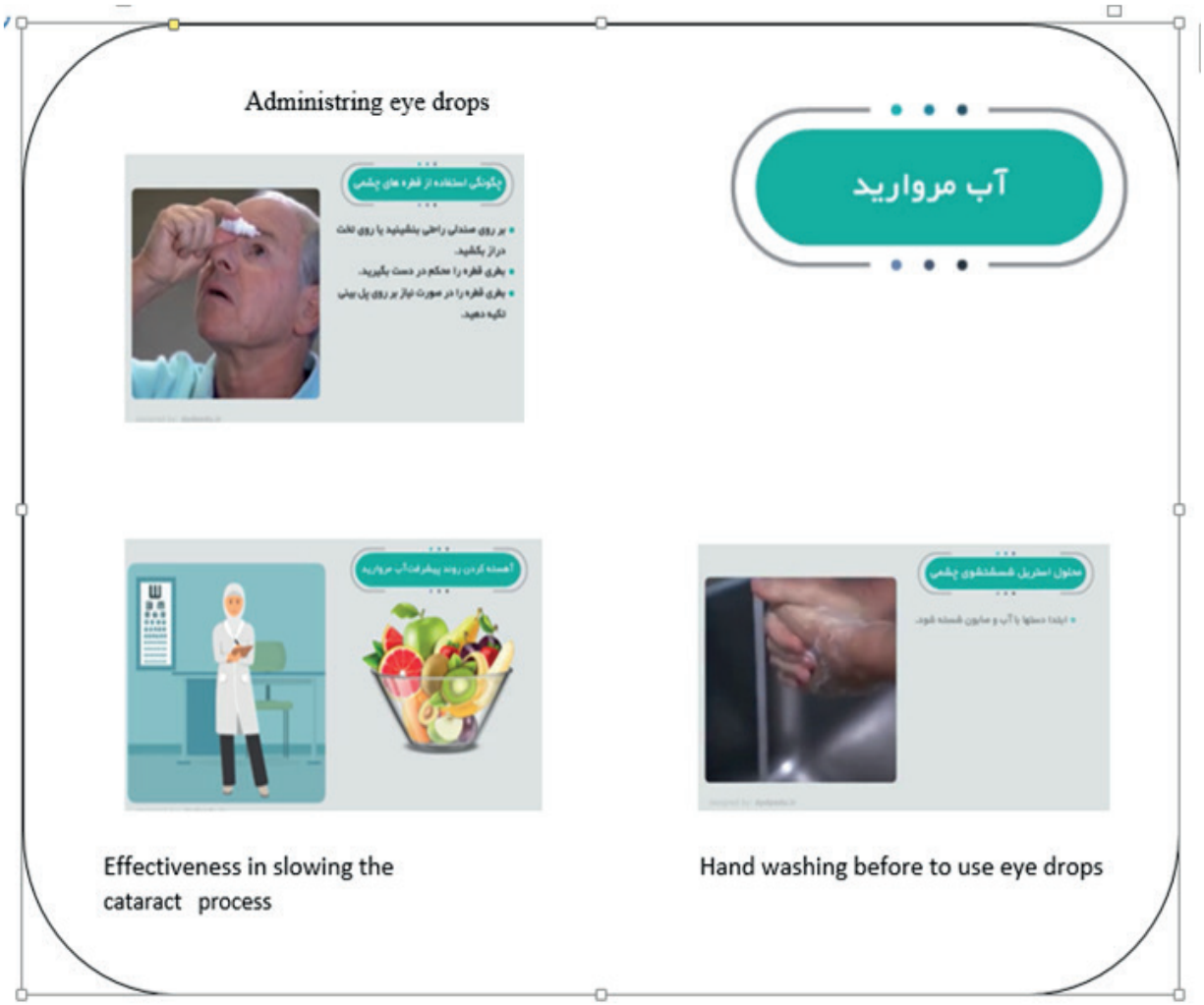


**Figure 2-** screenshots of the video-based training

the minimum sample size was estimated 31 in each group. However, considering the probability of dropout as 0.3, we evaluated 45 in each group as the final sample size in our study.

$$n = \frac{2\sigma^2 (Z_{\alpha/2} + Z_{\beta})^2}{(\mu_1 - \mu_2)}$$

Ninety patients were selected based on the convenient sampling method. Patients were assigned to the intervention and control groups based on permuted block randomization (block= 15, block size=6). Inclusion criteria were cataract patients who needed surgery with the discretion of physicians, intended to participate in the study, and had the ability to see and hearing. Among them, seven patients were excluded

due to the incompletion of the questionnaires(Figure 1). Each intervention group (educational video) and control group (educational booklet) was compared one day before andafter the training.

### *Stages of research*

After receiving the consent of the University Research Council to conduct research and obtaining ethical permission from the Ethics Committee,appropriate content on patients' self-care with cataracts was prepared using library reviews,valuable internal and external articles, and views of the supervision.[4,5,7,8] The topics were in three parts, including an introduction to cataract, causes, risk factors, clinical signs and diagnostic criteria, prevention and treatment approaches, and postoperative self-care.

The educational content was reviewed and evaluated by ten professors of the Ophthalmology Department of the Clinic affiliated to Shiraz University of Medical Sciences, and they applied the essentialmodifications. Then, the educational content was designed in two methods of video (Figure 2) and booklet.

It is worth noting that the contents of the educational booklet and video were quite similar.All video contents were shown stage-by-stage in the booklet in written forms and color still images (Table 1).

**Table 1.** Comparison of educational video and booklet features

| Total volume | Animation | Picture | Voice | Text | Education |
|---|---|---|---|---|---|
| Five minutes | * | * | * | * | Video |
| Seven pages | ---- | * | ------ | * | Booklet |

The researchers developed the video contents based on Mayer's multimedia principles[14] and the educational booklet based on the exact contents approved by ophthalmologists.Then, the researchers began the study after obtaining permission from the university research deputy and managers of Binagostar Ophthalmology Clinic in Shiraz.First, the study objectives were explained to the participants, and written informed consent was obtained. Then, the patients' demographic information (age, gender, level of education, job status, underlying disease, diabetes, and hypertension) was fully recorded at the beginning of the study. For preventing data leakage between intervention and control groups, every other week was assigned to the control or intervention group. The patients were trained insmall groups (five-member groups). The researchers completed the questionnaire items on their behalf for illiterate patients but based on patients' opinions. In the control group, theeducational booklet was shown and read to the patients. In the present study, the studied patients and analysts who performed the study analysis were blinded.

We made a questionnaire for assessing the patients' knowledge and behavior regardingcataract self-care. Thefirstpartofthequestionnaireincludeddemographic information: age, gender, job, level of education, and history of diabetes, hypertension, and underlying diseases. The second part had 20 four-option questions in three domains; general information about cataracts: definition, causes and risk factors, signs and symptoms, and diagnostic criteria (4 items).Prevention and management of cataracts included the intervention to reduce symptoms before surgery, primary treatment method, the time required for surgery, and complications of untreated cataract (4 items). Postoperative self-carebehaviors includedthe technique of administering eye drops or ointments, type of diet, correct sleeping or resting position, injury and infection prevention, eyeshield use, and permitted and unauthorized activities within oneweek post-surgery(12 items). The questionnaire was 20 four-option questions with each correct answer scoring between one to four points, an incorrect answer zero, and a total score between 0 and 43.

To evaluate the face and content validity of the questionnaire, tenexperts in the fields of ophthalmologyassessedthe quality of questions in terms of grammar and use of appropriate words, simplicity, relevance, andclarity; then,the required modification was done.The validity ratio (CVR) and content validity index (CVI) were 0.8 and 0.99, respectively, and the reliability of the tool was calculated as 0.839 by Cronbach's alpha method.

### *Statistical methods*

The collected data were analyzed in SPSS-16 by using descriptive and inferential statistical tests. The demographic characteristics of the participants are represented using descriptive statistics, i.e., frequency (percentage). These characteristics were compared between the two groups, using the Chi-square test for categorical variables. To assess the intervention effect in each group separately, paired t-test was used to compare patients' pretest and posttest scores.Independent samples t-test was used to compare the pretest scores of each dimension between the groups before the study. Furthermore, analysis of covariance test was used to compare the

posttest self-care performance with controlling age, which was significantly different between the two groups. P-value < .05 was considered significant.

### *Ethical considerations*

The Ethics Committee of Shiraz University of Medical Sciences approved this project (IR.SUMS.REC.1398.861). The necessary information on the research goals and process was provided to all the participants before conducting the study, and their written informed consent was obtained. To comply with the research ethics, patients were ensured that they could voluntarily withdraw from the study at any stage of the study. They were also assured that personal information would remain confidential, and only public figures would be provided.

## Results

Eighty-threepatientswere recruited through convenience sampling, and eligible participants were randomized based on permuted block randomization. The participants were blinded into two "parallel" groups, intervention (video-based training) and control (booklet training) groups (Figure 2).

The Participants' demographic characteristics are shown in Table 2.

**Table 2.** Demographic characteristics of patients among different groups

| Variable | Subgroup | Control N(%) | Intervention N(%) | Total | P-value |
|---|---|---|---|---|---|
| Gender | Female | 20 (46.5) | 18 ( 45) | 38 | 0.89 |
| | Male | 23 (53.5) | 22 ( 55) | 45 | |
| age | >60 years | 23 (53.5) | 32 (80) | 55 | 0.011 |
| | < 60 years | 20 (46.5) | 8 (20) | 28 | |
| Employment status | Retired | 17 (39.5) | 18 (45) | 35 | 0.750 |
| | unemployed | 17 (39.5) | 16 (40) | 33 | |
| | employment | 9(18.1) | 6 (15) | 15 | |
| Education level | Undereducated | 12 (27.9) | 18(45) | 30 | 0.394 |
| | elementary | 8 (18.6) | 5 (12.5) | 13 | |
| | Diploma | 18 (41.9) | 12 (30) | 30 | |
| | Above the diploma | 5 (11.6) | 5 ( 12.5) | 10 | |
| History of high blood pressure | Yes | 18( 34.9) | 15(37.5) | 30 | 0.804 |
| | No | 28 (65.1) | 25 ( 62.5) | 53 | |
| History of diabetes | Yes | 18 ( 41.9) | 11 ( 27.5) | 29 | 0.170 |
| | No | 25 (58.1) | 29 (72.5) | 54 | |
| Underlying diseases | Yes | 6 ( 14) | 11 (27.5) | 17 | 0.127 |
| | No | 37 ( 86) | 29 ( 72.5) | 66 | |

As shown above, the participants (n=83) in the intervention and control groups were homogenousin terms of demographic variables such as gender (P=0.89), employment status (P=0.857), history of high blood pressure (P=0.804), history of diabetes(P=0.170),andunderlyingdiseases(P=0.127). However, the mean age of patients in the intervention group was significantly higher than that of thecontrol group (P=0.011). The percentage of patients under 60 was considerably lower in the intervention group (20%)than that of the control group (46.5%).

Mean score and standard deviation in self-care performance subscales before and after the intervention in the intervention and control groups

were compared (Table 2).

**Table 2:** Within- and between-group comparison of each dimension of self-management scores before and after the intervention

| Self-care dimensions | Intervention group | | | Control group | | | Between-group comparison | |
|---|---|---|---|---|---|---|---|---|
| | Before | After | | Before | After | | | |
| | Mean±SD | Mean±SD | p-value[w] | Mean±SD | Mean±SD | p-value[w] | p-value[b] | p-value[a] |
| domain 1 (general information about cataracts) | 3.87±1.68 | 6.65±1.38 | <0.001 | 3.55±1.95 | 6.23±1.55 | <0.001 | 0.433 | 0.393 |
| domain 2 (prevention and management of cataract) | 3.92±2.10 | 8.20±1.77 | <0.001 | 3.37±2.28 | 7.79±2.32 | <0.001 | 0.256 | 0.957 |
| domain 3( Postoperative self-care behaviours) | 13.6±5.01 | 21.82±3.82 | <0.001 | 11.76±6.76 | 19.09±5.81 | <0.001 | 0.147 | 0.037 |

p-value[w]: within-group comparison in each interventional and control group based on paired t-test
p-value[b]: between-group comparison before the intervention based on independent t-test
p-value[a]: between-group comparison after the intervention based on analysis of covariance test with adjusting the effect of age

Our findings revealed that the mean of pretest self-care scores in all three dimensions did not differ significantly between the two groups (the column p-value[b]),ensuring us the baseline scores of the two groups were homogenous before the intervention. Moreover, in both groups, the mean scores of self-care performance increased significantly in all domains after the intervention (p-value[w]<0.001). Since there were no significant differences between the groups before the study, we compared the after-intervention scores by analyzingthe covariance test and adjusting the impact of age as a confounding variable. Our results showed that the mean score of dimensions 1 and 2 did not differ significantly between the groups. In contrast, the mean score of dimension 3 was higher in the intervention group thanthat of the control group (21.82±3.82 vs. 19.09±5.81, p-value=0.037). This result implied that our intervention had a beneficial effect on this subscale of self-care performance.

We investigated the relationship between the patients' self-care performance and their demographic characteristics (age, gender, level of education, job, and the status of underlying diseases) before and after the intervention(Table 3).

Table 3 represents the mean scores of self-care performance in other demographic characteristic variables for all three dimensions. As shown, there were no significant differences between male and female patients in all three dimensions of self-care performance in both intervention and control groups except for dimension 2 in the control group. Females had significantly higher scores than males (p-value=0.04). Regarding the effect of age, no significant difference was observed between patients being under and above 60 exceptfor dimension 1 in the control group. The patients above 60 had significantly higher scores than the patients who were under 60 (p-value=0.02). In addition, no significant discrepancy was detected between patients with and without diabetes in both intervention and control groups. In comparison,patients with hypertension had significantly higher self-care scores only in dimension onethan those without hypertension (p-value=0.038). The self-care performance scores showed no significant difference between women and men in the video-based training group. However,in the educational booklet group, the self-care performance of women was higher than that of men in dimension 2 (p = 0.040).In comparing two educational groups separately, the self-care performance of video-based training was the same in both age variables of above 60 and under 60 years. Still, the self-care performance score was significant in dimension 1 of the educational booklet posttest (p = 0.02), and it was higher in patients aged over 60. In the variable

**Table 3:** The mean of self-care performance in different categories of demographic characteristics in intervention and control groups

| | Intervention group | | | | Control group | | |
|---|---|---|---|---|---|---|---|
| | Dimension 1 | Dimension 2 | Dimension 3 | | Dimension 1 | Dimension 2 | Dimension 3 |
| **Sex** | Mean±SD | Mean±SD | Mean±SD | | Mean±SD | Mean±SD | Mean±SD |
| Male | 6.50±1.30 | 7.90±1.68 | 21.31±3.40 | | 5.82±1.64 | 7.30±2.49 | 18.43±6.55 |
| Female | 6.83±1.50 | 8.55±1.85 | 22.44±4.31 | | 6.70±1.34 | 8.75±1.88 | 19.85±4.91 |
| P-value | 0.457 | 0.256 | 0.361 | | 0.065 | 0.040 | 0.433 |
| **Age** | | | | | | | |
| Under 60 | 6.50±1.69 | 7.62±2.26 | 21.5±5.31 | | 5.65±1.72 | 7.40±2.72 | 17.30±6.02 |
| Above 60 | 6.85±1.33 | 8.34±1.63 | 21.9±3.46 | | 6.73±1.21 | 8.47±1.83 | 20.65±5.26 |
| P-value | 0.737 | 0.311 | 0.792 | | 0.020 | 0.131 | 0.058 |
| **Diabetes** | | | | | | | |
| Yes | 6.55±1.45 | 8.10±1.82 | 21.57±3.98 | | 6.04±1.56 | 7.96±2.30 | 5.63±1.12 |
| No | 6.91±1.22 | 8.45±1.69 | 22.63±3.41 | | 6.50±1.54 | 8.00±2.45 | 6.21±1.46 |
| P-value | 0.474 | 0.582 | 0.416 | | 0.345 | 0.956 | 0.930 |
| **Hypertension** | | | | | | | |
| Yes | 7.00±1.90 | 8.16±1.72 | 21.84±3.38 | | 6.11±1.61 | 7.71±2.46 | 19.00±5.79 |
| No | 6.06±1.53 | 8.26±1.91 | 21.80±4.60 | | 6.46±1.45 | 8.46±2.03 | 19.26±6.05 |
| P-value | 0.038 | 0.857 | 0.975 | | 0.477 | 0.318 | 0.888 |
| **Employment status** | | | | | | | |
| Retired | 6.00±1.32 | 8.05±1.69 | 21.00±3.53 | | 5.94±1.78 | 7.29±2.59 | 19.23±6.11 |
| unemployed | 7.06±1.34 | 8.18±2.10 | 22.43±4.48 | | 6.58±1.41 | 8.58±2.00 | 19.05±5.10 |
| employment | 7.50±0.83 | 8.66±1.03 | 22.66±2.65 | | 6.11±1.36 | 8.11±2.26 | 18.88±7.09 |
| p-value | 0.018 | 0.774 | 0.476 | | 0.474 | 0.269 | 0.990 |
| **Education** | | | | | | | |
| Undereducated | 6.72±1.36 | 7.88±1.96 | 21.83v4.54 | | 6.50±1.08 | 8.08±1.97 | 19.08±4.54 |
| elementary | 5.80±2.28 | 7.20±1.92 | 20.00±4.63 | | 5.87±1.95 | 7.00±2.77 | 16.62±6.90 |
| Diploma | 7.25±0.62 | 8.91±1.50 | 22.50±3.14 | | 6.05±1.76 | 8.05±2.48 | 19.50±5.97 |
| Above the diploma | 5.80±1.30 | 8.60±0.89 | 22.00±1.00 | | 6.80±1.09 | 9.00±1.73 | 21.60±6.50 |
| p-value | 0.105 | 0.228 | 0.694 | | 0.658 | 0.503 | 0.497 |

of education level using ANOVA test, due to our type of classification,four groups of low literacy, the secondary level of education, diploma, and above diploma, no difference was observed in the self-care performance score of patients in video-based training and educational booklet in terms of education level. In the relationship between job variables and patients' self-care performance score, due to the lack of samples, job subgroups were classified into three job categories (retired, unemployed, and employed). A significant difference was observed in the posttest of dimension 1 ($p = 0.048$).

As shown in Table 3, to differentiate the effects of job variables by exact post-hoc test, a pairwise comparison shows that retired and unemployed patients were significant compared to employed patients with ($p = 0.054$). Finally, by separating jobs in two groups of video-based training and an educational booklet with the exact post-hoc test, retired participants' self-care performance in dimension 1 in the video-based training group was significantly higher ($p = 0.052$).

There was a significant difference between the history of hypertension variable and patients' self-care performance pretest score in dimension 1 ($p = 0$). The initial knowledge of patients with hypertension was higher than that of people without hypertension. Concerning the relationship between the underlying disease variable and patients' self-care performance score, except for the self-care performance pretest score of dimension 1 with $p = 0.186$, there was a significant difference between patients with and without underlying disease in other domains. People with the underlying

disease had a higher self-care performance score than patients without underlying conditions. There was no relationship between the diabetes variable and patients' self-care performance score.

## Discussion

The present study compared the effects of video-based and booklet educational methods on the self-care performance of patients with cataracts. Based on the results, both approaches improved the patients' self-care performance. However, video-based training had a more significant effect on the patients' behavior toward postoperative care.

The result of the present study is consistent with that of Jothi et al.,in which the effects of video-assisted teaching on knowledge and self-care efficacy of epileptic patientswere evaluated and revealedthat this method could affect patients' knowledge and self-efficacy.[15]In addition, Maliheh et al. indicated that video-based training could improve pregnant women's self-efficacy.[16]Cornoiu et al. also compared the effects of animation, educational pamphlets, and face-to-face training methods on patients' knowledge of knee arthroscopy. Theyreportedthat animation could significantly influence people's knowledge.[17]Our study also showed that video-based training had improved the level of self-care behavior. One of the main factors influencing the effectiveness of this method is utilizing a combination of media such as image, animation, and audio, which can draw the patients' attention to the content and immerse the learner in the instructional process, especially in the teaching manual skills.[16-17] Consequently,the participants can achieve mastery in a piece of specific knowledge andskills.

Furthermore, our study revealed that both booklet and video had the same effect on teaching basic concepts. This result concurs with other studies, which indicated that both of these educational methods led to better learning among patientsundergoing coronary angiography and myocardial infarction, as well as those withhigh-risk behaviors.[18-19]These results show that both video and booklet methods can increase learners' knowledge and self-care behavior. Therefore, combining these two teaching methods could increase their efficacy because people with different learning preferences can choose the appropriate teaching method. Gündüz et al. reported that integrating educational approaches such as video and bookletcould reducepatients' pain before surgery.[20]We also examined other factors that could potentially affect the results of our study. The results showed that older women in the booklet and those who were retired in the video-based groups obtained higher self-care performance scores. Patients with hypertension or underlying disease received higher initial knowledge about cataract and were more educable.These results show that people have different learning preferences, and combining learning methods such as video and booklet can increase their self-care.Regarding study limitations, for future research, it is recommended that video-based and booklet training be compared for a longer time and with a larger sample size to achieve a more precise measurement of the self-care of patients undergoing cataract surgery.

## Conclusion

Given the effectiveness of video-based and booklet training for promoting patients' self-care performance referring to clinical centers, it is recommended to integrate video and booklets into patients' education to improve their self-care performance.

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