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The Effect of Self-care Educational Program and Remote Monitoring on Self-efficacy and Postoperative Outcomes in Patients with Retinal Detachment

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Abstract

Background: Retinal detachment is an ophthalmic emergency that often leads to vision loss, with patients facing challenges in recognizing symptoms and understanding essential postoperative care to prevent complications and safeguard the other eye. Therefore, patient self-care and its monitoring are necessary to create self-efficacy as one of the basic components in post-surgery management.

Aim: The present study was conducted with aim to investigate the effect of a self-care educational program and remote monitoring on self-efficacy and postoperative outcomes in patients with retinal detachment.

Method: This semi-experimental study was conducted on 70 patients who were selected through convenience sampling and randomly assigned to either the intervention or control group, with 35 patients in each group. After the surgery, the subjects of the intervention group received in-person education about a self-care program and were followed up remotely through WhatsApp upon discharge. The Perceived Health Competence Questionnaire was used to assess self-efficacy before the intervention, one week, and one month after the surgery for both groups.

Results: The analysis found no significant difference in the mean perceived health competence scores between the intervention and control groups over the study period (p=0.718).

Implications for Practice: Practitioners should consider developing more targeted and interactive educational interventions, as well as implementing more rigorous follow-up protocols to enhance patient self-management and prevent complications.

Keywords: Education, Remote monitoring, Retinal detachment, Self-care, Self-efficacy

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Introduction

One of the eye conditions that necessitates special attention and precise postoperative care is retinal detachment (1, 2). Retinal detachment is an essential surgical emergency for restoring vision. This condition occurs when the sensory neural layer separates from the pigmented layer of the retina (3). In such condition, various factors influence the forces affecting the adhesion of the layers, resulting in the accumulation of vitreous fluid between the two layers (4). Retinal detachment is mainly divided into three types: rhegmatogenous, tensile, and exudative or serous (5). The most common form is rhegmatogenous, which is caused by creating a hole in the retinal layer and accumulating fluid under it (4). In the stretching type, which is less common than the rhegmatogenous type, such as what happens in diabetic retinopathy patients, the retina is stretched by band-like scars that multiply under the outer layer of the fibrous membrane (5). The exudative type, which is very rare compared to the other two types, is caused by retinal dysfunction such as intraocular tumors or vascular diseases (5). The annual incidence of retinal detachment is reportedly 13.3 cases per 100,000 (6). Additionally, one in every 10,000 individuals experiences rhegmatogenous retinal detachment (7). This condition can occur for various reasons, including physical injuries, inflammatory conditions, age-related changes, or other eye diseases (5). Symptoms commonly observed before the onset of retinal detachment include blurred vision, seeing numerous floaters resembling spider webs, or seeing flashes of light with changes in the angle of view. Patients may find it challenging to determine which eye is affected due to these symptoms (5). Surgical treatment for retinal detachment involves repairing the detached retinal layers, creating new breaks to drain subretinal fluids, using laser therapy, or injecting gas into the subretinal space (7). After retinal detachment surgery, the patient must provide appropriate care and practice precise self-care. This care includes regular follow-ups by the physician, timely use of prescribed medications, and adherence to minimal activity (7, 8). Patient self-efficacy plays a crucial role in postoperative care. Self-efficacy, defined as the belief in one’s ability to successfully perform tasks, plays a significant role in the diagnosis and treatment of diseases (9). Regular and timely self-care monitoring after surgery plays a crucial role in enhancing patient self-efficacy (10, 11).

Providing accurate and continuous information and education to patients help them to manage their postoperative condition. This confidence in one's ability is directly associated with an increased sense of success and satisfaction with treatment, as well as a return to daily activities (11). Educational programs and remote monitoring have been extensively studied in recent years as tools to increase self-efficacy and improve postoperative management (12). These programs utilize modern technologies including telemedicine, mobile applications, and online platforms to educate and monitor patients in various areas like eye care, pain management, and follow-up on surgical outcomes (13). Patients acquire the necessary skills for managing their postoperative condition through interactive education and online communication (14). These approaches facilitate access to information, reduce the need for frequent in-person visits, and enhance doctor-patient interaction, all of which enhances patients' quality of life and increases their confidence for postoperative care (12).

Review of studies shows that most of the researches are performed on patients with eye problems, post-operative nursing care, psychological consequences of patients, adherence of nurses to the standard methods of care after surgery and performance of nurses (15, 16), and research has not been done on patients who have retinal problems, especially retinal detachment. Damage to the eye as an important organ in the body, in addition to psychological effects, causes limitations in a person's life. Considering the risk factors affecting the occurrence of this disease and the complications caused by it, the problems of patients in the stage of transfer from the hospital has not been paid attention, and most people have little information about eye surgery, especially its emergency surgeries and post-operative care. Also, patients' visit times are only for examination and targeted training has not been done in this period. Also, most of the education and self-care and empowerment programs have been carried out on chronic patients (17-19) and acute problems have received less attention. Considering the importance of self-care at the time of transfer from the hospital as well as care at home to improve outcomes and prevent complications, in addition to receiving education during hospitalization, it seems necessary to strengthen learning and follow up. Since no study has been conducted regarding the education and follow-up of patients with retinal detachment, and most of the studies with educational intervention were either in other diseases or investigated the factors, prevalence and treatment of retinal detachment; also considering the importance of eye problems, the unexpectedness of retinal detachment, psychological effects caused by vision loss, as well as following the

instructions and post-operative care, the present study was conducted with aim to determine the impact of a self-care educational program and remote monitoring on self-efficacy and postoperative outcomes in patients with retinal detachment.

Methods

This quasi-experimental study was conducted on all patients with retinal detachment who visited the emergency departments of ophthalmology hospitals (Labafi Nejad Hospital affiliated with Shahid Beheshti University of Medical Sciences, Farabi Hospital affiliated with the Tehran University of Medical Sciences, and Razi Ophthalmology Hospital affiliated with the private sector) in 2023-2025. The sample size was calculated based on a study by Sattar et al. (20) and the mean state anxiety scores after education in patients undergoing cataract surgery in the control and intervention groups (37.95 ± 7.04 and 44.1 ± 8.23, respectively). Thus, the sample size, with a power of 90% and a type I error of 5% and using G*Power software was determined to be 35 patients in each group. Out of 85 individuals assessed for eligibility, 15 were excluded due to not meeting the inclusion criteria (n=10) or declining to participate (n=5). Finally, 70 participants were randomly assigned to the intervention (n=35) and control (n=35) groups. All participants completed the follow-up phase and were included in the final analysis (Figure 1)

The initial sampling method was convenience sampling. The samples were subsequently assigned to the intervention and control groups randomly through block randomization. Ten blocks of eight were selected. Each block contained an equal number of samples from both groups in varying sequences. The first block was randomly chosen and the subsequent blocks were selected continuously. Inclusion criteria were men and women aged 45 to 70 years, having literacy, first-time retinal detachment surgery, and those with rhegmatogenous retinal detachment. Exclusion criteria consisted of patients with dementia, Alzheimer's disease, unwillingness to cooperate throughout the process, and incomplete receipt of the educational course.

Data were collected using demographic characteristics form and Perceived Health Competence Scale (PHCS), which was designed and developed by Smith et al. (1995) to measure self-efficacy and sense of competence for self-care and health. The demographic characteristics form included questions about gender, age, employment status, education, history of diabetes, history of hypertension, history of dyslipidemia, history of trauma, family history of retinal detachment, history of eye surgery, and history of underlying eye diseases. The PHCS consists of 8 questions rated on five-point Likert-scale that cover both behavioral and outcome dimensions. Responses are rated on a scale from 1 to 5 (Strongly Agree to Strongly Disagree). The range of scores is 8-40. A higher score indicates a greater perceived ability to control health-related outcomes and processes, while a lower score indicates less perceived ability (21). The validity and reliability of the questionnaire were confirmed by Shakibazadeh and colleagues, with a Content Validity Index (CVI) of 0.81 and a Content Validity Ratio (CVR) of 0.72. Reliability of the questionnaire was assessed using Cronbach's alpha coefficient, which ranged from 0.73 to 0.77 for individual items and was 0.78 for the entire questionnaire. Additionally, intra-class correlation coefficients (ICCs) were estimated using the test-retest method (22).

After obtaining written informed consent, patients with retinal detachment were invited to participate in the study. The demographic information questionnaire and the self-efficacy questionnaire were provided to all patients on the day of surgery and before the intervention. Patients were then randomly assigned to either the intervention or control group. The subjects in the intervention group received a one-session face-to-face educational program lasting up to two hours after the surgery. Non-face-to-face monitoring was conducted via WhatsApp, and in some cases, through telephone calls, with the researcher available to address patients' questions and concerns. The self-care educational package for patients with retinal detachment was actually an evidence-based package developed based on the clinical experience of the researchers, physicians, and literature reviews based on the educational needs of patients undergoing retinal detachment surgery. The training focused on surgery, position after surgery, fallow up and visit, taking medicine and how to use it, bathing time, travel, diet, warning signs and long care. The control group received only the routine interventions provided by the treatment centers. Patients in both groups were required to attend the treatment center for follow-up visits according to the treatment protocol. They were scheduled to come in for a follow-up visit one week after the surgery and then again one month after the surgery. Patients had the option to

complete the self-efficacy questionnaire either in person during their follow-up visits or via WhatsApp, based on their preference. Outcomes monitoring focused on re-hospitalization and side effects, especially infections, which were not observed in the study samples during the follow-up period. To adhere to ethical standards, all educational materials were provided to the control group upon completion of sampling. Data were analyzed using SPSS software (version 26) and repeated measures ANOVA, controlling for confounding factors. $p<0.05$ was considered significant.

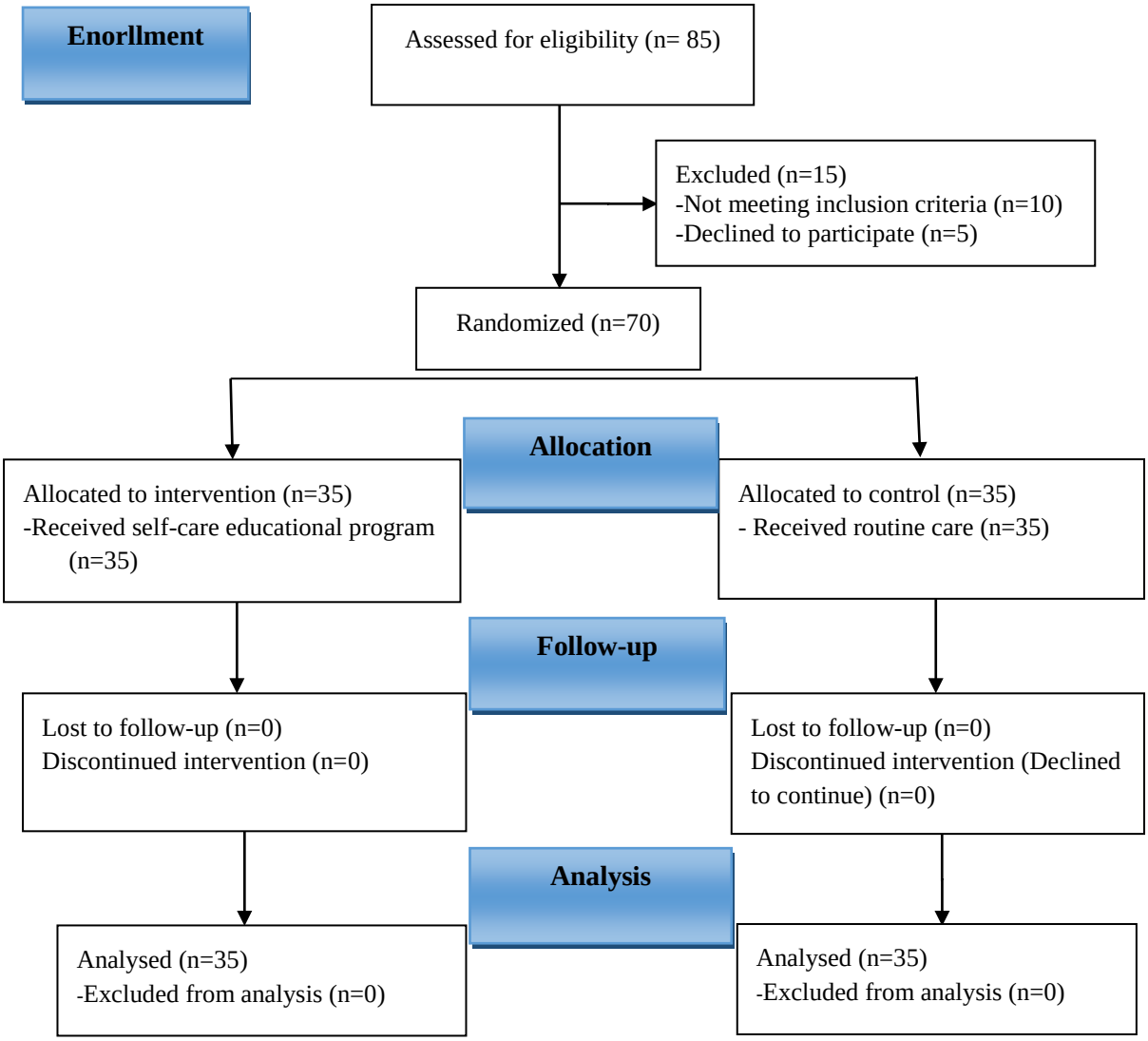

Figure 1. Flowchart of the effect of self-care educational program on self-efficacy and postoperative outcomes

Ethical Consideration

The study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences of Tehran (ethics code: IR.SBMU.PHARMACY.REC.1402.082). All ethical considerations such as voluntary participation, confidentiality of data, anonymity of questionnaires, and written consent were considered. The present study was carried out in accordance with the national research ethics guideline which are compatible with international research guidelines such as the Declaration of Helsinki, International Ethical Guidelines for Biomedical Research Involving Human Subjects CIOMS [1] and WHO research ethics guidelines.

[1] Council for International Organizations of Medical Sciences

Results

A total of 70 patients participated in the study. The mean age of participants was 60.86±6.96 years in the intervention group and 59.28±6.98 years in the control group. Demographic characteristics were examined to ensure the homogeneity of the two groups, to reduce the effects of confounding variables, and to increase the validity of the intervention results. The results of the chi-square test for comparing demographic variables between the two groups showed that there was no significant difference between the two groups. This indicates the randomness of the sample distribution and its homogeneity (p>0.05) (Table 1).

Table 1. Demographic characteristics of patients with retinal detachment in the intervention and control groups

Variables	Groups		Chi-square test
	Intervention	Control	
Age (Mean±SD)			t=0.94
			p=0.394
			df=68
Sex, N (%)			χ^2=0.93
Male	9(62.9)	18(51.4)	p=0.334
Female	13(37.1)	17(48.6)	df=1
Marital status, N (%)			
Married	31(88.9)	28(80)	χ^2=3015
Single	0(0)	3(8.6)	p=0.334
Separated	1(2.9)	1(2.9)	df=1
Widowed	3(8.6)	3(8.6)	
Level of education, N (%)			
Primary	13(37.1)	12(34.3)	χ^2=1.81
Secondary	4(11.4)	8(22.9)	p=0.611
High school	12(3.34)	11(31.4)	df=3
University	6(17.1)	4(11.4)	
Employment status, N (%)			
Employee	3(8.6)	2(5.7)	χ^2=3.68
Worker	1(2.9)	5(14.3)	p=0.298
Retired	7(20)	4(11.4)	df=3
Other	24(68.6)	24(68.6)	
History of Hypertension, N (%)			χ^2=0.22
Yes	18(51.4)	16(54.7)	p=0.811
No	17(48.6)	19(54.3)	df=1
History of Diabetes Mellitus, N (%)			χ^2=0.22
Yes	16(45.7)	18(51.4)	p=0.811
No	19(54.3)	17(48.6)	df=1
History of Dyslipidemia, N (%)			χ^2=1.17
Yes	12(34.4)	14(40)	p=0.555
No	23(65.7)	21(60)	df=2
History of Trauma, N (%)			χ^2=0.00
Yes	7(20)	7(20)	p=0.999
No	28(80)	28(80)	df=1
Family History of Retinal Detachment, N (%)			χ^2=0.00
Yes	2(5.7)	2(5.7)	p=0.999
No	33(94.3)	33(94.3)	df=1
History of Eye Surgery, N (%)			χ^2=2.52
Yes	28(80)	22(62.9)	p=0.185
No	7(20)	13(37.1)	df=1
History of Ocular Systemic Disease, N (%)			χ^2=0.22
Yes	17(48.6)	19(54.3)	p=0.811
No	18(51.4)	16(45.7)	df=1

The repeated measures ANOVA test was used to evaluate the mean Perceived Health Competence scores in patients over time, adjusting for age, gender, and education level. The assumption of sphericity for the dependent variables was tested using Mauchly's test. The results indicated that the sphericity assumption was not met (p=0.017). The Greenhouse-Geisser correction was employed to test sphericity and adjust the degrees of freedom. This approach was used to account for potential violations of the sphericity assumption. The changes in Perceived Health Competence between the two intervention and control groups during the study period (before, one week later, and one month later) were examined using repeated-measures analysis of variance. Mauchly's Test of Sphericity was statistically significant (p=0.023) and the Greenhouse-Geisser test showed that the effect of time was significant (p=0.032) (Figure 2).

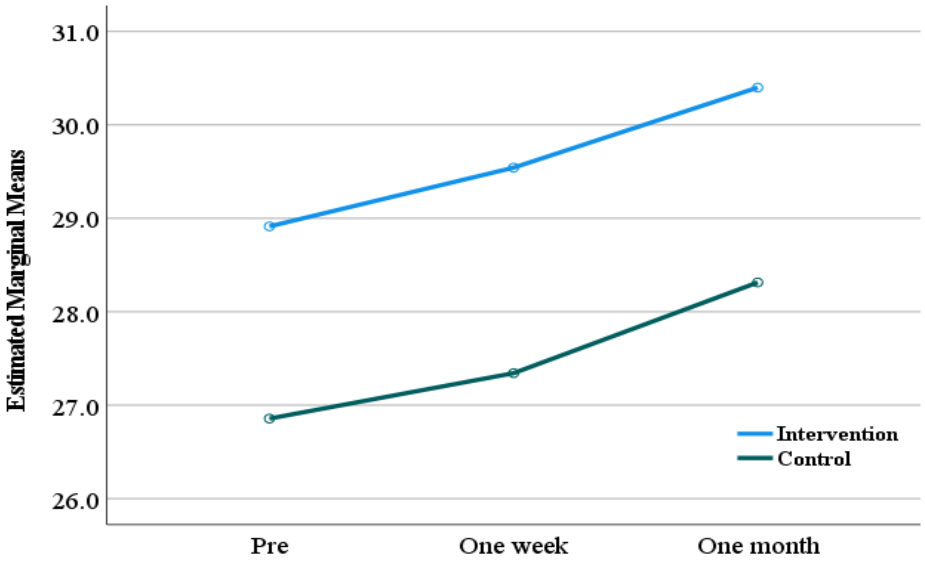

Figure 2: Mean perceived health competence scores in the intervention and control groups, adjusted for demographic variables

However, according to the Greenhouse-Geisser test, the interaction of time with groups, in other words, the effect of time with groups was not statistically significant (p=0.986). The changes in Perceived Health Competence between the two groups during the study period were not statistically significant (Table 2). Also, the group effect was not statistically significant (p=0.065).

Table 2. Mean perceived health competence scores in the intervention and control groups, adjusted for age, gender, and education level

Variables	Intervention group Mean±SD	Control group Mean±SD
Before surgery	28.91±5.87	26.86±5.11
One week after surgery	29.54±5.65	27.34±4.96
One month after surgery	30.4±5.34	28.31±5.43
Homogeneity of Covariance Variances (Mauchly's Test)	Repeated Measures ANOVA Test	
Mauchly's W=0.0894 p=0.023 df=2	Time Effect	p=0.032, df=1.808, F=3.676
	Group Effect	p=0.065, df=1, F=3.526
	Time*Group Effect	p=0.986, df=1.808, F=0.01

Discussion

The purpose of the current study was to determine the impact of a self-care education program and remote monitoring on self-efficacy and postoperative outcomes in patients with retinal detachment. The results of this study indicated changes in self-efficacy scores over time in both the intervention and control groups. However, comparisons of these changes at different stages between the two groups were not statistically significant. One possible reason is that the duration of patient monitoring might not have been long enough to fully assess the impact of the educational program. Behavioral changes and increased self-efficacy typically require time, and results might have been different over a longer period (23). On the other hand, the educational methods used in this study might not have been sufficiently effective for the patient group. The diverse approaches should be incorporated, including multimedia training, practical workshops, and individual and group counseling to enhance the effectiveness of an educational program (24).

In the present study, the factors such as multiple and long-term follow-ups, diverse educational methods, and attention to individual characteristics may not have been adequately controlled, which might explain the lack of significant differences between the two groups. Another possible reason could be the urgent nature of the patient's conditions. Educational and self-care programs and empowerment initiatives are often designed for chronic patients, whose ongoing illness and frequent hospitalizations make them to consider the educational programs more important. In contrast, these patients might not fully grasp the value of the educational program after the immediate threat is addressed. They may mistakenly believe that the surgery and resolution of the immediate issue mean they are completely recovered. This finding is consistent with results from other studies. Jani et al. (2019) found that implementing a multimedia educational program improved eye care practices among patients with type 2 diabetes (17). In their study, the chronic nature of diabetes and the awareness of the consequences and effects of high blood sugar on the eyes, facilitated by the education provided, improved patient care practices. In contrast, education in the emergency department is typically brief and intensive, whereas inpatient education is usually more extended and comprehensive. Additionally, patients with retinal detachment may have difficulty to focus on and understand the educational material due to the stress of potential vision loss after surgery. Although the researcher attempted to mitigate this issue by providing education in the presence of a fully aware and attentive companion, it remains a challenge.

In their research, Teo (2021) found that a self-care program for identifying and monitoring macular pathologies can help engage patients and encourage their participation in self-care activities. This program revealed significant motivational events and clinical progress in some patients, indicating its potential as an effective tool for managing eye diseases. However, the results indicated that while implementing these programs in clinical settings can be beneficial, it also comes with challenges that necessitates enhancement in process and execution to ensure maximum effectiveness (25). Consistent and precise recommendations from healthcare providers play a crucial role in enhancing patient self-care and increasing adherence to health-improving behaviors (26). This finding is inconsistent with the current study, and possible reasons for this discrepancy may be differences in the type of disease, the nature of the illness, and patient's understanding of the importance of self-care. Also, the study by Sheta et al. (2021) demonstrated that implementing an educational program for patients after retinal detachment surgery improved postoperative pain management (10). Additionally, the study by Zhang et al. indicates that higher-quality discharge education for cataract patients can lead to better outcomes over time by improving patients' readiness for discharge (27). These studies primarily focused on reducing acute complications and short-term care, while less attention was paid to long- long-term care and monitoring.

Implications for practice

Healthcare providers should explore more engaging and personalized educational strategies, incorporating interactive tools and tailored content to better address patient individual needs. Additionally, continuous and more frequent follow-ups could be integrated into patient care plans to provide ongoing support and address potential complications early. Developing comprehensive educational programs and robust follow-up systems improve patient outcomes and prevent vision loss.

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Conflicts of interest
The authors declared no conflict of interest.

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None.

Authors' Contributions
Sedigheh Safari and Soolmaz Moosavi performed the planning and designing of the study. Data gathering was done by Sedigheh Safari. Analysis of data was done by Mehdi Khabazkhoob. Abbas Abbaszadeh was a major contributor in writing the manuscript. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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