A Feasibility Study the Effectiveness of Self-care Promoting Program on Self-care Behavioral and Clinical Outcomes in People with Corneal Transplantation: A Quasi-experiment Study

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Abstract: Corneal transplantation is the most effective treatment for visual impairment caused by corneal blindness and can improve patients' quality of vision. However, pre- and post-operative self-care is necessary to reduce the risk of complications and graft rejection. This one-group, quasi-experimental design with repeated measures aimed to determine the feasibility and effectiveness of self-care promoting programs on self-care behavior, anxiety, and clinical outcomes in individuals with corneal transplantation. Thirty participants who met the inclusion criteria were purposively recruited from a corneal excellence center in Bangkok, Thailand, from October 2021 to August 2022. The data collection instruments included the Demographic and Health Data Forms, the Self-Care Behavior Questionnaire, and the Self-Rating Anxiety Scale. The data were analyzed using descriptive statistics, paired t-tests, and Friedman and Wilcoxon signed-rank tests.

The program was found to be feasible, with all participants able to attend for 30 days postoperation. In terms of effectiveness, participants demonstrated improved self-care behavior and reduced anxiety compared to pre-program levels. Visual acuity also showed improvement 30 days postoperation, with 83.3% of participants having a clear corneal graft. These findings are significant for nursing practice, as they suggest that this program could be a promising tool for enhancing self-care behavior in individuals undergoing corneal transplantation. Nurses could potentially use this program to promote self-care behavior, alleviate anxiety, and enhance clinical outcomes. However, further research with randomized control is necessary before widespread implementation can be recommended.

Keywords: Corneal transplantation, Feasibility study, Nursing, Self-care promoting program, Self-care behavior, Visual acuity

Received 20 April 2024; Revised 2 June 2024; Accepted 4 June 2024

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Introduction

Corneal diseases are the third leading cause of blindness globally, following cataracts and glaucoma.[1] These diseases include dystrophies, inflammation, ulcers, and ectasia.[2] Visual impairment resulting from corneal blindness can significantly impact overall health. Corneal transplantation is widely considered the most effective treatment for this condition.[3] According to records from the Thai Red Cross (TRC), 10,376 eyes in Thailand were awaiting corneal

https://doi.org/10.60099/prijnr.2024.268807

transplantation in April 2024. From 1969 to April 2024, the TRC provided 18,825 eyes for corneal transplantation in Thailand.[4] The average waiting time for corneal transplantation is 3-5 years.[5] Therefore, perioperative care, especially following corneal transplantation, is crucial to minimize postoperative complications, which can occur immediately or be delayed and are often related to specific keratoplasty techniques.[6]

Anxiety during surgery can be attributed to a combination of mental, emotional, biological, and physiological factors. The pressure experienced during surgery can lead to a loss of self-control, resulting in unhelpful symptoms such as restlessness, sweating, and nausea.[7] Additionally, acquiring patients' information before surgery is crucial for ensuring their cooperation and reducing anxiety.[8] Nurses play a vital role in assessing and addressing physical and mental concerns preoperatively, effectively contributing to anxiety reduction. Providing patients with comprehensive information about the disease, possible complications, and self-care behaviors using nontechnical language is essential for anxiety management.[9]

Early postoperative care, spanning from 1-7 to 30 days after surgery, plays a vital role in ocular surface management, inflammation control, infection prevention, and the early detection of postoperative complications, particularly wound leakage and wound dehiscence.[10] Additionally, individuals undergoing corneal transplantation face a serious risk of corneal graft rejection, leading to graft failure and causing visual impairment or corneal blindness.[11] Consequently, postoperative care management, including the proper timing and administration of topical eye drops, aims to empower individuals with better self-care behaviors and reduce the risk of complications, such as graft rejection and endophthalmitis. While self-care programs have been established for various medical conditions such as systemic hypertension,[12] heart[13] and kidney diseases,[14] and ophthalmic conditions like cataracts and diabetic retinopathy, programs for corneal transplantation recipients are notably absent in Thailand.

Therefore, the authors developed a self-care-promoting program for corneal transplantation recipients using Orem's theory and explored its feasibility.[15] This program systematically integrates personalized education on the disease with pre-, intra-, and post-operative self-care management. Information brochures and instructional videos were created to enhance understanding. The self-care program aimed to promote self-care behavior to preserve graft transparency and achieve optimal visual outcomes. Comprehensive training covered essential practices, such as self-observation and eye drop administration. Moreover, regular postoperative telephone follow-ups were conducted to identify any issues promptly.[16] Additionally, a feasibility study was performed to assess the effects of the self-care-promoting program on behavioral and clinical outcomes in individuals who have undergone corneal transplantation.

Conceptual Framework and Literature Review

The conceptual framework of this study was built based on Orem's self-care nursing theory[15] and a literature review of corneal transplantation. Orem's theory involves three aspects: self-care requisites, self-care deficits, and nursing systems. Self-care refers to activities to enhance one's life, health, and quality of life. Adequate information guides self-care decisions and helps prevent complications.[17] The objective of self-care management is to meet therapeutic self-care demands. Individuals with illnesses require increased self-care management, including recognition, adaptation, maintenance, and rehabilitation.[18] Appropriate self-care management is crucial for corneal transplantation recipients. Their self-care requirements include addressing eating habits, infection prevention, postoperative care, symptom awareness, emotional management, adherence to follow-up, and using eye drops. Supportive nursing

is essential for individuals with high self-care needs. The supportive-educative nursing system provides training and support to individuals, their families, and caregivers.[19]

A Self-Care-Promoting (SCP) program, based on Orem's theory of nursing,[15] was developed to support self-care management. The program consists of three phases: (i) assessing the situation, (ii) taking action and evaluating effectiveness, and (iii) ensuring continuity of care through follow-up to enhance self-care capacity and improve visual quality. In summary, this study utilized a proposed program that integrated Orem's self-care nursing theory with the specific self-care requirements of corneal transplantation recipients.

Study Aim and Hypothesis

This study aimed to develop and test the feasibility of the SCP Program and explore its effects on behavioral and clinical outcomes in corneal transplantation recipients. The following hypothesis was tested: the mean score of self-care behavior, anxiety, visual acuity, and corneal graft status would improve after participation in the program.

Methods

Design: This study utilized a one-group quasi-experimental design with repeated measures. This report followed the TREND (Transparent Reporting of Quasi-experimental/non-randomized evaluations) guideline for quasi-experimental studies.

Sample and Setting: The study included individuals with corneal diseases who had undergone corneal transplantation, including endothelial keratoplasty (EK), deep anterior lamellar keratoplasty (DALK), and penetrating keratoplasty (PKP), with optical indications at the corneal excellence center (CEC) of a university hospital in Bangkok, Thailand, between October 2021 and August 2022. Purposive sampling was employed. The inclusion criteria were individuals who underwent corneal transplantation, were at least 18 years old (with additional cognitive and daily living ability assessments for those more than 60 years),[20,21] had good visual acuity in the non-operated eye, could communicate in and understand Thai, were reachable by phone, and were willing to participate in the study. Participants with severe complications, such as bleeding or infection, during or after surgery were excluded. All 30 participants, who were eligible and voluntary to participate in this program, completed the program. Only one participant waited for the cornea transplantation over 12 weeks, and the corneal specialist re-evaluated the ophthalmic conditions. The PI also reviewed the SCP program for the participants to provide knowledge and understanding of self-care, and activities in the program.

The sample size was determined using the G*Power 3.1 software package,[22] employing repeated ANOVA statistics to calculate an effect size of 0.25.[23] Similar effect sizes in a previous study,[24] ranging from 0.36 to 0.50 were utilized for sample calculation. The confidence value (α) was set to 0.05, and the test power (β) at 0.80. Data from the statistical analyses were used to calculate the sample size, resulting in 28 cases. A minimum sample size of 30 participants was used to account for possible dropouts.[23]

Ethical Considerations: Ethical approval was obtained from the Ethics Committee on Human Research of the Faculty of Medicine Ramathibodi Hospital, Mahidol University (MURA2021/695), and Faculty of Medicine, Chulalongkorn University (1433/2021). The study adhered to the principles of protecting the rights of the participants. Comprehensive information on the study objectives, procedures, and potential benefits was provided to the participants. Written informed consent was obtained voluntarily, and participants had the right to withdraw at any time. Participants' information was kept confidential, and the data presented were anonymized and used solely for research purposes.

Instruments: These comprised four data collection instruments and the intervention.

The Demographic Data Form: The primary investigator (PI) developed this form to collect participants' data on age, gender, occupation, income, education level, health coverage service, treatment, and caregivers.

The Health Data Form comprised ten questions; the PI developed it to collect participants' clinical information about corneal diseases, previous eye surgeries, visual acuity, chronic diseases, medication use, type and duration of surgery, previous corneal transplantation, history of graft rejection and failure, glaucoma, inflammatory diseases, and corneal donor quality. Information was retrieved from participants' medical records.

The Self-care Behavior Questionnaire was developed by the PI based on Orem's conceptual framework and literature review. It comprises 36 items on seven aspects: food intake, drug use, infection prevention, complication prevention, symptom observation, emotional management, and follow-up visits, for example, observing abnormal symptoms, such as eye pain, red eyes, or blurred vision. The responses of each item were rated on three levels: 0 = not done at all; 1 = occasional action; and 2 = daily practice. The total score ranged from 0-72, with a higher score meaning higher self-care behaviors. Interpretation of scores was based on a percentage estimation, with at least 80% considered perfect, 60-79% considered good, and less than 60% considered not good. Three experts, a cornea specialist, an advanced practice nurse in ophthalmology, and a registered nurse at the ophthalmology department, reviewed the content validity. The content validity index (CVI) was 1. The questionnaire was initially piloted with ten participants who had undergone corneal transplantation and had a Cronbach's alpha coefficient of .80 in the pilot and .82 in the actual study.

The Self-Rating Anxiety Scale (SAS), a pivotal tool in our study, was developed by Zung et al. in 1971,[25] and used with permission to assess anxiety levels in the participants. The SAS, a widely employed tool, was translated into Thai by Thammaraksa in 2008.[26] The questionnaire consists of 20 statements expressing anxiety-related feelings and behaviors, for example, "I feel more nervous and anxious than usual." Participants' responses are given on a 4-point scale ranging from "not at all or rarely" to "almost always." Positive questions reflecting anxiety symptoms are scored from 1 to 4. In contrast, negative questions representing the absence of anxiety were scored in reverse order. Scores are averaged, and based on Zung's interpretation, an average score of 20-35 indicates normal or no anxiety, 36-47 mild to moderate anxiety, 48-59 high anxiety, and 60-80 the highest level of anxiety. The internal consistency reliability of the SAS was assessed in this study using Cronbach's alpha coefficient, resulting in a value of 0.72 (vs. 0.82 in a study by Zung et al.[25]), indicating acceptable reliability. The SAS is a valuable tool for evaluating anxiety levels and has been widely employed in research and clinical settings.

The Self-care Promoting (SCP) Program and Implementation

The PI developed the SCP program based on Orem's self-care nursing theory framework[15] and a literature review.[17,27-29] The participants were involved in an SCP program for 12 weeks preoperation and four weeks postoperation, with data collected at four time points: before the corneal transplantation (getting on the waiting list for corneal transplantation), seven days after the program, and at 7 and 30 days postoperation. Before corneal transplantation, the program aimed to provide practical knowledge and understanding of self-care. Activities included relationship building, emphasizing the importance of preoperative preparation, assessing self-care needs, giving advice and education on pre-, intra-, and post-operative self-care behaviors, and identifying abnormal symptoms requiring immediate hospitalization. Information was delivered using educational material, guiding participants and their families. The CEC developed a brochure that was distributed to

participants. Preoperative anxiety assessments were conducted, and relaxation techniques were recommended. Participants and relatives had the opportunity to ask questions, and individualized teaching techniques, which took approximately 30 minutes, were applied to address specific self-care needs.

Self-care skill development focused on eye care, specifically eye drop application and cleaning. Participants and their relatives practiced these skills using the correct methods demonstrated by the PI. Practice sessions were evaluated using a Drug Drop Assessment Form. If participants encountered difficulties administering eye drops correctly, they were encouraged to practice further and receive repeated teaching, if necessary. Additionally, a brochure emphasizing the importance of correctly using eye drops to prevent graft rejection was provided to enhance participants' understanding. A researcher-created record form was also provided to encourage eye drops' proper and consistent use.

Moreover, self-assessment of any abnormalities after surgery helped participants perform a self-evaluation of possible symptoms such as blurred vision, eye pain, red eyes, and photophobia that required immediate hospital visits. Videos about postoperatively abnormal symptoms and correct eye drop administration at the right time, along with a record form, were displayed to participants and their relatives. The PI employed teaching techniques tailored to individual self-care needs. After completing the program, participants were encouraged to further develop their knowledge and skills through continuous monitoring. This step took approximately 20–30 minutes.

Three experts, a corneal specialist, an ophthalmic nurse specializing in clinical teaching, and an advanced practice nurse in the ophthalmology department, assessed the program for content validity regarding content, activities, duration, and arrangement. The program was adjusted following the experts' suggestions. The SCP program is outlined in **Appendix, Table 1.**

Data Collection: The study was conducted between October 2021 and August 2022. A trained research assistant collected the data, and the PI implemented the SCP program. The research assistants worked in the clinic and were trained by the PI, and completed four data collection forms. Data were collected at different time points: (i) on the day of the preoperative program, (ii) 7 days after participating in the program, (iii) at seven days postoperation, and (iv) at 30 days postoperation.

Data Analysis: The data were analyzed using a statistical software program. Descriptive statistics describe the demographic data, including frequency, distribution, percentage, mean, and standard deviation. A paired t-test was used to compare self-care behavior mean scores across two postoperative periods. The Wilcoxon matched-pairs signed-rank test was used to measure anxiety scores that were not normally distributed. This non-parametric test compared the pre- and post-test mean scores of anxiety scores. The chi-square and Friedman tests compared pre- and post-operative visual acuity.

Results

Participant characteristics

Most participants identified as Buddhists (18 females, 60.00%). The participants were between 18 and 80 years old, and approximately half were between 61 and 80 years old (53.33%). The mean age of the participants was 57.63 (SD = 16.52) years. Around half of the participants had bachelor's and higher degrees, sufficient income, had caregivers, were couples, enrolled in a universal coverage scheme, and lived with family. For clinical characteristics, more than one-third had an underlying condition of hypertension, ocular condition of Fuchs' corneal endothelial dystrophy, and received the Descemet membrane endothelial keratoplasty (DMEK) technique of the right eye. Participants' demographic data and clinical characteristics are presented in **Table 1.**

Table 1. Participant characteristics (N = 30)

Characteristics	n (%)	Characteristics	n (%)
Gender		Income sufficiency	
Male	12 (40.00)	Deficient	1 (3.33)
Female	18 (60.00)	Sufficient	21 (7.0.00)
Age (years)		Surplus	8 (26.67)
M = 57.63, SD = 16.52			
18-40	5 (16.67)	Healthcare Payment	
41-60	9 (30.00)	Universal coverage	12 (40.00)
61-80	16 (53.33)	Government	6 (20.00)
Religion		Social security	6 (20.00)
Buddhism	26 (86.67)	Self-payment	6 (20.00)
Christianity/Islam	4 (13.33)	Caregivers	
Marital status		Yes	26 (86.67)
Single	9 (30.00)	No	4 (13.33)
Couple	16 (53.33)	Current living arrangements	
Widowed/ Divorced	5 (16.67)	With families	22 (73.33)
Education level		With relatives	6 (20.00)
Primary level	8 (26.66)	Alone	2 (6.67)
Secondary/ Diploma	8 (26.66)	Previous ocular surgery	
Bachelor and higher	14 (46.68)	None	23 (76.67)
Occupation		Corneal Surgery	7 (23.33)
Unemployed/ housewife	18 (60.00)	Ocular conditions	
General employee/ pensioner	7 (23.33)	Fuchs' corneal endothelial dystrophy	12 (40.00)
Government officer	2 (6.67)	Bullous keratopathy	7 (23.33)
Personal business	2 (6.67)	Keratoconus	5 (16.67)
Agriculture	1 (3.33)	Corneal scar	4 (13.33)
Surgical techniques		Macular corneal dystrophy	2 (6.67)
DMEK	10 (33.33)	Ocular comorbidities	
Triple operation	6 (20.00)	None	14 (46.67)
PKP	5 (16.67)	Cataract	9 (30.00)
DALK	5 (16.67)	Glaucoma	4 (13.33)
DSAEK/ ALK	4 (13.33)	Vitreoretinal/ Uveitis	3 (10.00)
Underlying medical conditions		Drug allergies	
(Possibly more than 1 condition)		No	23 (76.67)
Hypertension	9 (30.00)	Yes	7 (23.33)
Diabetes mellitus	2 (6.67)	Side eye surgery	
Others (i.e., kidney disease, cancer thyroid disease, AIDS)	7 (23.33)	Right	17 (56.67)
		Left	13 (43.33)
No	14 (46.66)		

Note. DMEK= Descemet membrane endothelial keratoplasty, PKP = Penetrating keratoplasty, DALK = Deep anterior lamellar keratoplasty, DSAEK = Descemet's stripling automate membrane endothelial keratoplasty, ALK = Anterior lamellar keratoplasty

Anxiety: The Wilcoxon signed-ranks test was used to compare anxiety scores before and after the program. The results in **Table 2** showed that the mean anxiety score after the program was significantly lower than before.

Table 2. Comparison of anxiety score and base corrected visual acuity using Wilcoxon signed-ranks test and Friedman test at different times (N = 30)

Variables	Min-max	Median	Mean rank	IQR		
Anxiety score						
Before participation	20.00-37.00	23.00	12.56	7.00	-2.182^{w}	< .05
After participation (7 days)	20.00-37.00	22.00	12.33	3.50		
BCVA (logMAR) Possible value 0.00-3.00						
Preoperation	0.00-3.00	1.30	2.30	1.53		
Postoperation day 7	0.20-3.00	1.00	2.18	1.50	13.82^{F}	< .05
Postoperation day 30	0.00-3.00	0.75	1.52	0.84		

Note. IQR = interquartile range; w = Z, Wilcoxon signed-ranks test
BCVA = best corrected visual acuity; F = c^2, Friedman test

Self-care behavior: All participants could attend the program for 30 days after surgery. The study evaluated participants' self-care behavior at 7 and 30 days postoperation. The mean scores were 69.87 (SD = 1.59) and 69.70 (SD = 2.02). Scores ≥ 80% indicated excellent self-care; the scores were 97.02% and 96.80% at 7 and 30 days, respectively, indicating excellent self-care behavior. Statistical analyses revealed no significant differences between the scores at 7 and 30 days postoperation (**Table 3**). Individual self-care behavior scores of the participants at 7 and 30 days using the paired t-test showed no statistically significant differences (p = .67) in the self-care behavior scores in all aspects, including eating, drug use, infection prevention, complication prevention, observation of symptoms, emotional management, and side examination.

Table 3. Comparison of self-care behavior scores at 7 and 30 days postoperation (N = 30)

Possible value = 0-72	7 days postoperation min = 66.00 max = 72.00		30 days postoperation min = 64.00 max = 72.00		t-test	p-value
	Mean	SD	Mean	SD		
Self-care behavior score	69.87	1.59	69.70	2.02	0.44	0.67
Excellent health care behavior (scores ≥ 80%)	97.02%		96.80%			

Note. SD = standard deviation

Visual acuity and corneal graft clarity: Improvements in visual acuity and corneal graft clarity were assessed among corneal transplant recipients at preoperation, postoperation 7 and 30 days. Table 2 shows that the median best corrected visual acuity (BCVA) scores before and at 7 and 30 days postoperation were significantly different (c^2 =13.82, p < .05).

This study compared the pre- and post-operative visual acuity scores (logMAR). No significant improvement was demonstrated at seven days postoperation (z = -1.62, p = .10). However, visual acuity significantly improved at 30 days postoperation compared to that during preoperation (z = -3.11, p < .05). Additionally, the visual acuity at 30 days postoperation was significantly better than that at seven days postoperation (z = -2.92, p < .05) (**Table 4**). Results showed that 56.7% of the corneal grafts were evident at seven days post-operation, increasing to 83.3% at 30 days postoperation. Notably, acute graft rejection did not occur (**Table 5**).

Table 4. Pairwise comparison of best corrected visual acuity at different times (N = 30)

Pairwise comparison (Time)	Z	p-value
Preoperation vs. Postoperation day 7	-1.62	.10
Preoperation vs. Postoperation day 30	-3.11	< .05
Postoperation day 7 vs. Postoperation day 30	-2.92	< .05

Note. Z, Wilcoxon signed- ranks test

Table 5. Corneal graft status at postoperative days 7 and 30 (N = 30)

Graft status	Postoperative day 7		Postoperative day 30	
	N	%	N	%
Clear	17	56.70	25	83.30
Graft edema 1+	5	16.70	5	16.70
Graft edema 2+	8	26.70	0	0
Acute graft rejection	No	-	No	-
Total	30	100.00	30	100.00

Discussion

This study aimed to examine the feasibility and effectiveness of a SCP program on behavioral and clinical outcomes in corneal transplantation recipients. Most participants were female, and Fuchs' endothelial corneal dystrophy (FECD) was the most common ocular disease.

Overall, Orem's nursing theory recognizes the significance of essential conditioning factors, including past experiences, in shaping self-care abilities and anxiety management. Acknowledging and incorporating these factors into nursing practice allows healthcare professionals to provide holistic, patient-centered care that addresses patients' unique needs and experiences.[15] Furthermore, the participants who had previously undergone corneal transplantation reported having no anxiety about the surgical procedures. Instead, they expressed concerns about the availability of a donor cornea before the scheduled operation date. The study's findings have theoretical implications, suggesting that the SCP program can effectively reduce anxiety in individuals undergoing corneal transplantation. Participants in this study had significantly lower anxiety scores after receiving the program. The program provided information and knowledge about pre-, intra-, and post-operative self-care ability using videos, enabling participants to understand the surgical process better, gain self-care behavior, and alleviate their anxiety.

Participants who had previously undergone corneal transplantation in either the same eye with repeated surgery or the other eye (23.30%) had lower preoperative anxiety scores compared to that of others. According to Orem's nursing theory, essential conditioning factors, including age, sex, developmental stage, cultural background, socioeconomic status, and past experiences, significantly influence an individual's ability to engage in self-care and manage anxiety. These factors contribute to shaping perceptions, beliefs, and self-care skills. The lower preoperative anxiety scores of individuals who had previously undergone corneal transplantation indicate the impact of experience on self-care agency. Applying Orem's nursing theory, nurses can evaluate the impact of past experiences on patients' self-care abilities and anxiety management. Furthermore, nurses can identify the potential barriers or challenges affecting patients' self-care agency by understanding their history. Then,

nursing interventions can be tailored to address these specific needs and provide appropriate support, education, and resources to enhance patients' self-care abilities and promote effective anxiety management.

Regarding the feasibility of the SCP program, our findings contribute to the growing evidence on the effectiveness of self-care interventions in improving patient outcomes in surgical settings. All participants in the SCP program were prepared physically and mentally before surgery. After completing the program, the participants were encouraged to develop their knowledge and skills through continuous monitoring.

The participants had a mean self-care behavior score of 97.02%; this was considered excellent, indicating that they were actively caring for themselves postoperation. Furthermore, no statistically significant difference was shown between self-care behavior scores at 7 and 30 days postoperation, suggesting that participants maintained consistent self-care behaviors throughout the recovery period. This finding indicates that participants effectively managed their postoperative care, which is crucial for successful postoperative outcomes. The program provided information on possible complications after corneal transplantation and proper self-care to prevent complications using videos. This nursing intervention created awareness among the patients, leading to a greater understanding of self-care and, eventually, the development of appropriate self-care behaviors. The mean self-care behavior score at 30 days postoperation was 96.80%. Consistent with Orem's nursing theory,[15] a person must intentionally initiate self-care to maintain life and health; they should recognize the need for self-care correctly and continuously perform self-care behaviors.

The study nurses evaluated the participants for self-care problems and provided appropriate solutions, leading to the early detection and treatment of abnormal symptoms.[30] Drug administration, particularly eye drops, has been highlighted as a crucial aspect of self-care after corneal transplantation.[31] The importance of strictly following the treatment plan and the significance of drug use have been emphasized. This study found that participants frequently missed doses of anti-inflammatory eye drops, especially when going out. Notably, frequent administration of anti-inflammatory eye drops and artificial tears is necessary, at least every 2 hours, during the initial postoperative week. This regimen should be maintained for more than six months.[32] Hence, drug administration behaviors need to be modified and promoted to enhance overall self-care.

Visual acuity was assessed using the BCVA and measured in logMAR units. Measurements were taken thrice during preoperation and 7 and 30 days postoperation. The average BCVA improved from 1.30 logMAR preoperation to 1.00 and 0.75 logMAR at 7 and 30 days postoperation. The visual acuity levels at 7 and 30 days postoperation improved compared to that during the preoperative levels. Additionally, the visual acuity at 30 days postoperation was significantly better than that at seven days postoperation. These results indicate that corneal transplantation effectively improves visual acuity. Furthermore, the condition of the corneal graft improved, with precise graft rates of 56.7% and 83.3%, respectively, at seven days and 30 days postoperation. The increased clear graft rate at 30 days postoperation suggested ongoing improvement as the graft healed and stabilized, aligning with the improved visual acuity observed over time.

Furthermore, the absence of acute graft rejection at 7 and 30 days postoperation is a positive finding, suggesting that corneal graft rejection is a potential complication of corneal transplantation that can negatively affect vision and overall health. However, this complication must be monitored for a more extended postoperative period,[33] and continuous follow-up is required. Therefore, this SCP program may be initiated for all corneal transplantation recipients, and nurses should play an essential role in providing advice, assessing patients, and monitoring care by telephone.[34] Additionally, nurses should help participants develop and maintain appropriate self-care behaviors to prevent complications so that the corneal graft can

remain clear and aid long-term visual acuity. Holistic care is essential for persons undergoing corneal transplantation and promotes self-care by enhancing their potential to care for themselves. The findings of this study indicate that corneal transplantation recipients who participated in the SCP program performed self-care effectively, which is crucial for successful postoperative outcomes.

Limitations

First, the study participants were recruited from a single setting. Hence, the findings may not be generalizable to other populations of corneal transplantation recipients. Notably, nearly 25% of participants had previously undergone corneal transplantation and, therefore, had some experiences in self-care. Additionally, the follow-up duration in the present study was short, so future studies on visual acuity and the status of the postoperative transplanted corneal graft with longer follow-up durations are required. Future studies may address the above limitations, such as employing a larger sample size, utilizing multiple anxiety measurement methods, and conducting randomized controlled trials to validate further the efficacy of self-care programs for reducing anxiety in patients undergoing corneal transplantation.

Conclusions and Implications for Nursing Practice

This study's findings suggest that the SCP program can effectively alleviate anxiety, improve and maintain self-care behavior, and potentially improve clinical outcomes. Nurses can use this program as a guideline for caring for corneal transplantation recipients, and it aims to aid them in developing and achieving proper self-care abilities. The program used an individualized teaching style pre-, intra-, and post-operation. In brief, the participants watched a video on pre-, intra-, and post-operation self-care behaviors to prevent complications. Additionally, they practiced self-assessment for abnormal symptoms to facilitate prompt treatment. Continuous care and support were provided after patients were discharged. Follow-up via phone calls encouraged participants to perform correct self-care behaviors and effectively prevent postoperative complications.

Acknowledgments

The authors gratefully acknowledge all the participants for their cooperation in this study.

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Appendix

Table 1. Summary of the self-care-promoting program

Time schedule	Objective of content	Activities
1st Step: Preoperation (45 minutes)	Persons' education on self-care management after corneal transplantation	• Introduce and overview program • Assess the preparation of the participant • Conduct self-care knowledge assessment • Administer an anxiety questionnaire and record visual acuity • Provide knowledge on corneal transplantation, and develop skills of self-care
7 days after participating in the program (telephone follow-up 20 minutes)	Assess anxiety and self-care knowledge	• Assess anxiety and self-care knowledge
1 day preoperation (20 minutes)	Review patients and explaining proper self-care behaviors	• Visit participants • Review and explain the proper pre-, intra-, and post-operative self-care behavior • Provide a video demonstrating abnormal symptoms after surgery • Give advice and encouragement before surgery
2nd Step: preoperation	Develop skills in self-care management	• Review and explain the process of eye drop administration, eye cleaning, and self-assessment and how to identify the need for self-care • Demonstrate and practice proper eye drop administration • Provide handout brochures • Give advice and allow participants to ask questions
3rd Step: postoperation - Discharge day (15 minutes)	Promote the continuation of self-care management	• Give the participant a self-care manual book • Provide a medication record form and show how to assess abnormal symptoms
- 7 days postoperation (15 minutes)	Monitor for postoperative self-care behavior, visual acuity, corneal graft status, complications and symptoms	• Self-care behavior, best corrected visual acuity (BCVA), and corneal graft status assessment • Encourage right eye drops administration • Motivate and improve skills by recording eye drops, assessing eye symptoms, and examining whether abnormalities exist every day
- 30 days postoperation (30 minutes)	Monitor: **Feasibility** of self-care behavior	• Self-care behavior, BCVA, and corneal graft status assessment • Consultation on various self-care problems and how to promptly administer eye drops

การศึกษาความเป็นไปได้ของการใช้โปรแกรมส่งเสริมการดูแลตนเองต่อพฤติกรรมการดูแลตนเองและผลลัพธ์ทางคลินิกในผู้ที่ได้รับการปลูกถ่ายกระจกตา : การศึกษากึ่งทดลอง

กนกอร ทัพเจริญ นพวรรณ พินิจขจรเดช วิลาวัณย์ พวงศรีเจริญ*

บทคัดย่อ: : การปลูกถ่ายกระจกตาเป็นวิธีการรักษาความผิดปกติในการมองเห็นที่มีสาเหตุจากโรคของกระจกตาที่มีประสิทธิภาพสูงสุด และทำให้คุณภาพการมองเห็นผู้ได้รับการปลูกถ่ายกระจกตาดีขึ้น ทั้งนี้การดูแลตนเองทั้งในช่วงก่อนและหลังการผ่าตัดปลูกถ่ายกระจกตาจะช่วยลดความเสี่ยงต่อการเกิดภาวะแทรกซ้อนและภาวะต่อต้านเนื้อเยื่อกระจกตา การศึกษาครั้งนี้ได้พัฒนาโปรแกรมส่งเสริมการดูแลตนเองขึ้นตามกรอบทฤษฎีของโอเร็มเพื่อศึกษาความเป็นไปได้ของการใช้โปรแกรม และผลลัพธ์ของการใช้โปรแกรมต่อพฤติกรรมการดูแลตนเอง ความวิตกกังวล และผลลัพธ์ทางคลินิกในผู้ได้รับการการปลูกถ่ายกระจกตา โดยการศึกษากึ่งทดลองกลุ่มเดียวแบบวัดซ้ำ ผู้เข้าร่วมวิจัยที่มีคุณสมบัติตามเกณฑ์กำหนดจำนวน 30 ราย ณ ศูนย์ความเป็นเลิศด้านกระจกตา กรุงเทพมหานคร ประเทศไทย ในระหว่างเดือนตุลาคม 2564 ถึงสิงหาคม พ.ศ. 2565 โดยเครื่องมือในการศึกษาประกอบด้วยแบบสอบถามข้อมูลส่วนบุคคล แบบบันทึกข้อมูลสุขภาพ แบบสอบถามพฤติกรรมการดูแลตนเอง และแบบประเมินความวิตกกังวลด้วยตนเอง (Self-rating Anxiety Scale: SAS) วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา การทดสอบแบบวัดซ้ำสองครั้ง (paired t-test) การทดสอบฟรีดแมน (Friedman test) และการทดสอบวิลคอกซัน (Wilcoxon signed-rank test)

ผลการศึกษาพบว่า การใช้โปรแกรมมีความเป็นไปได้ โดยผู้เข้าร่วมโปรแกรมทุกคนสามารถเข้าร่วมโปรแกรมได้ตลอดระยะ 30 วันหลังผ่าตัด สามารถคงรักษาพฤติกรรมการดูแลตนเองในระดับดีและมีความวิตกกังวลลดลงเมื่อเปรียบเทียบกับก่อนเข้าร่วมโปรแกรม สามารถมองเห็นได้ดีขึ้นในระยะเวลา 30 วันหลังการผ่าตัด และมีสภาวะเนื้อเยื่อกระจกตาใสร้อยละ 83.3 ผลการศึกษาครั้งนี้สามารถนำไปประยุกต์ใช้ในการพยาบาลและพัฒนาคุณภาพการดูแลสำหรับผู้ได้รับการปลูกถ่ายกระจกตาเพื่อส่งเสริมพฤติกรรมการดูแลตนเอง ลดความวิตกกังวล และเพิ่มผลลัพธ์ทางคลินิกในผู้ที่ได้รับการปลูกถ่ายกระจกตา อย่างไรก็ตาม ควรทำการศึกษาเพิ่มเติมด้วยการทดลองสุ่มแบบมีกลุ่มควบคุมก่อนนำไปใช้ทั่วไป

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คำสำคัญ: ปลูกถ่ายกระจกตา การศึกษาความเป็นไปได้ การพยาบาล โปรแกรมส่งเสริมการดูแลตนเอง พฤติกรรมการดูแลตนเอง ระดับการมองเห็น

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