### <u>original research</u>

# Efficacy of Evidence-based Nursing for Senile Cataract Complicated with Primary Angleclosure Glaucoma

Qi Zhou, MD; Ayixianmuguli Wufuer, BD; Jian Guo, BD

### ABSTRACT

**Objective** • To explore the efficacy and ocular indicator changes of evidence-based nursing in elderly patients with cataracts complicated with primary angle-closure glaucoma (PACG) after surgery.

**Methods** • 100 elderly cataract patients combined with PACG treated in the People's Hospital of Xinjiang Uygur Autonomous Region between February 2019 and October 2020 were included in the study and equally assigned to a control group and an experimental group by random draw. The control group adopted conventional nursing, and the experimental group intervened with evidencebased nursing. A thorough analysis was conducted based on the comparison of nursing effectiveness, nursing satisfaction, complication rate at 1, 2, and 3 weeks after surgery, QLI (Quality of Life Index), PSQI (Pittsburgh Sleep Quality Index), SPEED (Standard Patient Evaluation of Eye Dryness), SEEQ (Salisbury Eye Evaluation Questionnaire), eyesight and intraocular pressure between two groups of patients.

**Results** • The evidence-based nursing was more effective in treating patients with senile cataracts and PACG after surgery compared with routine care (P = .002). The patients in the experimental group were more satisfied with evidence-based nursing than those in the other

**Qi Zhou, MD; Aiyixianmuguli Wufuer, BD**, Department of Ophthalmology; People's Hospital of Xinjiang Uygur Autonomous Region; Urumqi; Xinjiang Uygur Autonomous Region; China. **Jian Guo, BD**, Nursing Department; People's Hospital of Xinjiang Uygur Autonomous Region; Urumqi; Xinjiang Uygur Autonomous Region; China.

*Corresponding author: Jian Guo, BD E-mail: 25353612@qq.com* 

### INTRODUCTION

The manifestation of cataracts is triggered by the slow metabolism of the lens and also of the whole body with age, consequently resulting in an inclination of cataract onset in group (P < .001). The experimental group yielded a more desirable outcome than the control group in terms of the complication rate of patients of the two groups at 1 week, 2 weeks, and 3 weeks after surgery (P = .02, .003, < .001). In contrast to the group with routine care, the evidencebased nursing group obtained significantly higher scores of QLI (P < .001), but intensely lower results of PSQI (P < .001) .001). Lower SPEED and SEEQ results of the experimental group were observed, as compared to the control group (P= .001, < .001). The patients in the experimental group enjoyed better eyesight and intraocular pressure after the evidence-based nursing in comparison with the control group (both P < .001). The group with evidence-based intervention garnered a more desirable result than the group with routine care about the complication rate at 1, 2, and 3 weeks after surgery, PSQI, SPEED, SEEQ and intraocular pressure.

**Conclusion** • Evidence-based nursing intervention reaped huge fruits in the improvement of the efficiency and quality of nursing work and also in the optimization of the ocular indicators of patients, which is highly applicable in clinical practice. (*Altern Ther Health Med.* 2024;30(10):257-261).

the elderly.<sup>1-3</sup> The onset of cataracts keeps the patients' eyesight at bay, giving rise to blurred vision, abnormal tear secretion, or even blindness, which leaves the patients in a dreadful condition in daily life. In general, surgical treatment is the main treatment for cataracts. Clear lens exchange, as a quintessential example, is used to supersede the lens with an intraocular lens for treatment.<sup>3</sup>

Primary angle-closure glaucoma (PACG) is a distinct form of glaucoma that occurs due to the closure of the anterior chamber angle of the eye, leading to impaired drainage of aqueous humor and increased intraocular pressure.<sup>4-6</sup> PACG is particularly prevalent in the elderly population and can result in diminished visual field, decreased vision, optic atrophy, and elevated intraocular pressure.<sup>4,5</sup> Without timely intervention and appropriate nursing care, PACG can cause irreversible damage to the optic nerve and result in permanent vision loss.<sup>6</sup>

While surgical treatment, such as clear lens exchange, is commonly employed as the main therapeutic approach for cataracts, complete recovery of eyesight in patients with cataracts complicated by PACG is not immediately achieved after surgery.<sup>7</sup> Therefore, postoperative nursing intervention plays a crucial role in promoting recovery and optimizing visual outcomes in these patients.

By using evidence-based nursing, the researchers could utilize the existing body of knowledge and research evidence to inform and guide their nursing interventions, ensuring that the care provided was based on the best available evidence. Given the significance of cataracts complicated with PACG in the elderly population, this study aims to investigate the efficacy and ocular indicator changes associated with evidence-based nursing interventions in elderly patients with this condition after surgery.

A thorough analysis was conducted based on the comparison of nursing effectiveness, nursing satisfaction, complication rate at 1 week, 2 weeks, and 3 weeks after surgery, QLI, PSQI, SPEED, SEEQ, eyesight, and intraocular pressure between two groups of patients. By comparing the outcomes of patients receiving routine nursing care with those receiving evidence-based nursing, this study seeks to provide valuable insights into the effectiveness of evidence-based nursing interventions in improving nursing outcomes and optimizing ocular indicators.

The results of this study are expected to contribute to the existing body of knowledge on nursing interventions for cataracts complicated with PACG in the elderly. By demonstrating the benefits of evidence-based nursing, this study can potentially guide clinical practice and inform healthcare professionals about the importance of incorporating scientific evidence into nursing care. Ultimately, the findings of this study can enhance the quality of nursing work, improve patient outcomes, and promote better care for elderly individuals with cataracts complicated by PACG.

### MATERIALS AND METHODS

#### **General information**

A cohort of 100 elderly cataract patients combined with PACG treated in People's Hospital of Xinjiang Uygur Autonomous Region between February 2019 and October 2020 was included in the study and assigned to a control group and an experimental group by random draw, with 50 cases in each group. Patients in the experimental group were aged from 63-75, and those in the control group were from 66-76. The two groups did not differ regarding the patients' general data such as gender, age, course of disease, and operation time (P > .05). See Table 1 for details:

#### Inclusion/exclusion criteria

**Inclusion criteria.** (1) The patients met the clinical manifestations of cataracts combined with PACG; (2) Patients

age  $\geq 60$  years old; (3) The patients had no history of drug allergy, no history of drug abuse, and no bad habits; (4) The patients' heart, lung, and kidney functions were normal, and had no other organic disease; (5) This study was approved by the hospital ethics committee, and all patients voluntarily participated in the study and signed an informed consent form.

**Exclusion criteria.** (1) The patient had coagulopathy and was taking anticoagulant drugs; (2) The patient had other ocular diseases, such as dry eyes, retinal detachment, etc.; (3) The patient had undergone eye-related surgery, such as myopia surgery.

#### Method

The control group underwent routine nursing intervention. The nursing staff provided routine care for patients after surgery, including monitoring changes in various vital signs after surgery, recording the medications and prognostic effects, pouring attention to changes in patient's emotions, and offering timely psychological counseling to patients. Communication with patients and their families was also indispensable, and the patients were timely informed about their conditions.

Patients in the experimental group adopted evidencebased nursing intervention. The nursing staff received professional nursing knowledge training and took care of patients in strict accordance with individual differences and nursing standards. The patients' postoperative vital signs changes were also monitored, and ocular indicators were regularly checked by the staff. If the patients' postoperative rehabilitation effect fails to meet expectations, the nursing staff should communicate with the doctor in time. Special personnel were also arranged to supervise and inspect the work of nursing staff to ensure that the nursing work was done accordingly based on the professional theory and the individual differences of patients.

#### Indicators observation

The nursing effectiveness, nursing satisfaction, complication rate at 1, 2, and 3 weeks after surgery, QLI, PSQI, SPEED, SEEQ, eyesight, and intraocular pressure between two groups of patients were compared.

**Nursing effectiveness:** Markedly effective when the patient's prognosis is in line with expectations, there are no adverse reactions or other complications, and the quality of

**Table 1.** Comparison of general data between the two groups  $(\overline{x \pm s})$ 

Groups	Experimental group	Control group	$t/\chi^2$	P value
Gender (male/female)	25/25	26/24	0.04	.84
Age (year)	69.65±4.31	70.22±4.60	0.64	.52
Height (cm)	165.09±5.12	165.61±5.73	0.48	.63
Weight (kg)	69.95±5.33	69.70±5.24	0.24	.81
The course of disease (month)	5.27±1.05	5.40±1.06	0.62	.54
Operation time (hour)	1.22±0.36	1.20±0.33	0.29	.77
History of smoking (year)	9.94±3.73	10.00±3.69	0.08	.94
History of drinking (year)	16.89±5.44	16.77±5.45	0.11	.91
Hypertension (case)	9	11	0.25	.62
Hyperlipidemia (case)	5	8	0.80	.37
Diabetes (case)	11	8	0.58	.44

**Figure 1.** Comparison of the nursing effectiveness between the two groups



\* Indicates the comparison results of the effective rates of the two groups,  $\chi^2$ =9.49, *P* = .002.

Note: Figure A shows the effective rate in the experimental group. Among the patients, 33 cases are markedly effective, 15 cases are effective, and 2 cases are ineffective. The total effective rate is 96%; Figure B shows the effective rate of care for patients in the control group, of which 20 cases are markedly effective, 17 cases are effective, and 13 cases are ineffective. The total effective rate is 74%.

sleep is not affected; Effective when the prognosis of the patient is at an average level, with minor adverse reactions, and the quality of sleep is slightly affected; Ineffective when the prognosis of the patient is poor, with serious adverse reactions such as insomnia.

QLI scoring standards include daily activities, work, and life, interpersonal relationships, etc. Each standard has a full score of 10 points. The higher the score, the better the patient's quality of life, and vice versa.

The PSQI ranges from 0 to 21 points, the higher the score, the worse the sleep quality.

SPEED is an evaluation standard to measure the degree of a patient's disease performance, including dryness, foreign body sensation, pain, and tearing. The score ranges from 0 to 24 points, a score below 1 indicates asymptomatic or disappearance of symptoms, 2-9 points indicate mild clinical manifestations, and more than 10 points indicate severe disease manifestations.<sup>10-12</sup>

SEEQ is a score for the symptoms of human eye diseases, which mainly include eye swelling, difficulty in opening eyes, dry eyes, and eye congestion.

The standard value of intraocular pressure is (16±3) mmHg.

#### Statistical processing

Data management and analysis were performed in this study by employing SPSS version 20.0, and GraphPad Prism version 7 (GraphPad Software, San Diego, USA) was used for plotting the graphics. The research included count data and measurement data. A *t* test was performed for the analysis of measurement data, represented by (±s), and an  $\chi^2$  test was performed for count data, expressed as [n(%)]. The difference was considered significant when P < .05.





\* indicates the comparison results of nursing satisfaction between the two groups,  $\chi^2$ =8.31, *P* < .001.

Note: Picture A shows the satisfaction of the patients in the experimental group. Among them, 41 cases are very satisfied, 7 cases are satisfied, and 2 cases are dissatisfied. The total satisfaction rate is 96%; Figure B shows the care satisfaction of patients in the control group, of which 28 are very satisfied, 10 are satisfied, and 12 are dissatisfied. The total satisfaction is 76%.

**Figure 3.** Comparison of the complications rate in the two groups at 1 week, 2 weeks, and 3 weeks after surgery



Note: The abscissa represents 1 week, 2 weeks, and 3 weeks after surgery from left to right. The ordinate represents the complication rate (%). The figure shows the comparison results between the complication rate of 6% in the experimental group and the rate of 22% in the control group at 1 week after operation,  $\chi^2$ =5.32, P = .02; Two weeks after the operation, the complication rate of the experimental group was 6% compared with the control group of 28%,  $\chi^2$ =8.58, P = .003; Three weeks after the operation, the complication rate of 8% in the experimental group is compared with the rate of 38% in the control group,  $\chi^2$ =12.70, P < .001.

#### RESULTS

### Comparison of the nursing effectiveness between the two groups

The evidence-based nursing was more effective in treating patients with senile cataracts and PACG after surgery compared with routine care, as shown in Figure 1 (P < .05).

#### Comparison of nursing satisfaction between the two groups

Figure 2 demonstrated that the patients in the experimental group were more satisfied with evidence-based nursing than those in the other group (P < .05).

Figure 4. Comparison of QLI and PSQI between the two groups



<sup>a</sup>indicates the comparison results between the PSQI score (10.24 $\pm$ 2.03) of the experimental group and the PSQI score (16.67 $\pm$ 3.31) of the control group, *t* = 11.71, *P* < .001

<sup>b</sup>indicates the comparison results between the QLI score of the experimental group ( $55.76\pm4.68$ ) and the QLI score of the control group ( $51.00\pm4.39$ ), t=5.25, P < .001.

Note: The abscissa indicates the PSQI and QLI from left to right, and the ordinate indicates the score.

**Figure 5.** Comparison of SPEED and SEEQ results between the two groups



<sup>a</sup>indicates the comparison results between the SPEED score (7.39 $\pm$ 0.54) of the experimental group and the SPEED score (9.66 $\pm$ 0.89) of the control group, *t* = 15.42, *P* < .001;

<sup>b</sup>indicates the comparison results between the SEEQ score (2.88±0.11) of patients in the experimental group and the SEEQ score (3.51±0.64) of patients in the control group, t = 6.86, P = .001.

Note: The abscissa indicates SPEED and SEEQ from left to right, and the ordinate indicates the results.

**Table 2.** Comparison of eyesight and intraocular pressure between the two groups  $(\overline{x} \pm s)$ 

Groups	Eyesight	intraocular pressure (mmHg)
Experimental group	0.88±0.05	14.38±1.48
Control group	0.67±0.03	18.45±2.20
t	25.47	10.85
P value	<.001	<.001

## Comparison of the complication rate in the two groups at 1 week, 2 weeks, and 3 weeks after surgery

The experimental group yielded a more desirable outcome than the control group in terms of the complication rate of patients of the two groups at 1 week, 2 weeks, and 3 weeks after surgery. See Figure 3.

#### Comparison of QLI and PSQI between the two groups

In contrast to the group with routine care, the evidencebased nursing group obtained significantly higher scores of QLI (P < .05), but intensely lower results of PSQI (P < .05). See Figure 4.

## Comparison of SPEED and SEEQ results between the two groups

In Figure 5, lower SPEED and SEEQ results of the experimental group were observed, as compared to the control group (P < .05).

## Comparison of eyesight and intraocular pressure between the two groups

Results in Table 2 displayed that the patients in the experimental group enjoyed better eyesight and intraocular pressure after the evidence-based nursing in comparison with the control group (P < .05).

#### DISCUSSION

Timely surgical treatment after the onset of the cataract is indispensable, or it invariably results in blindness otherwise, which may impair the self-care ability and mental health of patients and keep them at bay. Surgical treatment is currently the most effective treatment for cataracts, which can substantially avoid irreversible effects on patients.<sup>13-15</sup> However, a full recovery of eyesight requires appropriate nursing during the postoperative rehabilitation stage. Therefore, the improvement and optimization of nursing work is a crucial factor in promoting postoperative recovery of cataract patients.<sup>16-18</sup> The causes of PACG mainly include genetic factors, living habits, and primary diseases. Though glaucoma is a relatively common cause of blindness, timely and correct treatment and protection are feasible to secure a positive outcome. As the body functions of the elderly are gradually degraded and their metabolism slows down, the elderly are more prone to some metabolic diseases such as cataracts.<sup>19-21</sup> Elderly patients are in many cases accompanied by some basic diseases such as high blood pressure and diabetes, which consequently gives rise to a higher incidence of complications or adverse reactions after surgery. Evidence-based nursing is a nursing model that takes care of patients according to professional nursing theory, which guarantees scientific and reliable nursing work to a certain extent. To examine the efficacy and ocular indicators changes of evidence-based nursing in elderly patients with cataracts complicated with PACG after surgery, this article matched elderly patients with cataracts and PACG as the research object and implemented routine nursing and evidence-based nursing on them. The nursing effectiveness, nursing satisfaction, complication rate at 1 week, 2 weeks, and 3 weeks after surgery, QLI, PSQI, SPEED, SEEQ, eyesight, and intraocular pressure between two groups of patients were put into comparison.

The results of this study demonstrated that the effective rate of nursing care, nursing satisfaction, QLI quality of life score, and visual acuity of the experimental group were

notably higher than those of the control group (P < .05). It showed that evidence-based nursing yielded a rosy outcome in elevating the quality and efficiency of nursing work and patients' quality of life, and also in optimizing postoperative eyesight rehabilitation. Evidence-based nursing has also been widely praised and highly recognized among the research objects in this research. Moreover, the group with evidencebased nursing garnered a more desirable result than the group with routine care about the complication rate at 1, 2, and 3 weeks after surgery, PSQI, SPEED, SEEQ, and intraocular pressure (P < .05). Manifestations such as insomnia triggered by negative emotions may occur after surgery in some patients. The results of this study presented that the sleep quality of patients under the evidence-based nursing intervention was less affected, which ensured a positive mental state of the patients.<sup>22-24</sup> The patients' rehabilitation effect can be obtained by detecting the postoperative intraocular pressure of patients in light that increased intraocular pressure is one of the manifestations of PACG. A lower intraocular pressure of patients under the evidence-based nursing intervention in this study was indicative of a better prognosis and a lower chance of recurrence in the experimental group. The results of this study conformed with the research results given by Tian Chenfei who stated that patients with cataracts and glaucoma enjoy a shorter postoperative vision recovery period and a significant reduction in intraocular pressure under evidencebased nursing that has better quality and higher efficiency than conventional nursing, which fully proved the reliability of the results of this research.

The limitations of this study should be acknowledged. Firstly, the sample size was relatively small, with only 100 elderly patients included in the study. A larger sample size would have provided more statistical power and increased the generalizability of the findings. Secondly, the study duration spanned from February 2019 to October 2020, which might not have been sufficient to capture long-term outcomes and potential changes in nursing practices over time. Additionally, the study was conducted in a single hospital, which could limit the generalizability of the results to other settings or populations. It is important to consider these limitations when interpreting the results of the study and to conduct further research with larger sample sizes and longer follow-up periods to validate and expand upon the findings.

In conclusion, it is assumed that evidence-based nursing is effective in ameliorating the efficiency and quality of nursing work and improving the ocular indicators of patients. which is of certain application value in clinical practice.

#### AUTHOR CONTRIBUTIONS

Qi Zhou and Aiyixianmuguli Wufuer contributed equall to this study

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