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Original Article

Interventional nursing promotes visual recovery in senile cataract with glaucoma and reduces the incidence of postoperative complications

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Abstract: Objective: To analyze the effect of interventional nursing on the treatment of patients with senile cataract and glaucoma. Methods: We retrospectively analyzed 135 patients with cataract and glaucoma. All patients underwent phacoemulsification and were divided into two groups according to different nursing care methods: the control group (n=59) and the intervention group (n=76). Patients in the control group were treated using routine nursing measures, and those in the intervention group were treated using targeted interventions together with routine care. The total incidence of complications and visual acuity were analyzed in the two groups. The Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS) were administered before and after treatment, and a higher score indicated more severe depression and anxiety. The quality of life scale was used to assess and compare the patients' quality of life (physical, emotional, cognitive, role, and social) between the two groups, and to obtain the satisfaction scores of the two groups. Results: After nursing intervention, visual acuity recovery was significantly higher in the intervention group than in the control group ($P<0.05$). The intraocular pressure in the intervention group was significantly lower than that in the control group ($P<0.05$). After nursing intervention, the SAS and SDS scores of the intervention group were significantly lower than those of the control group ($P<0.05$) ($P<0.05$). After nursing intervention, the total quality of life score was significantly higher in the intervention group than in the control group ($P<0.05$). The incidence of complications in the intervention group was significantly lower than that in the control group ($P=0.043$). The patient satisfaction rate in the control group was significantly lower than that in the intervention group ($P=0.014$). Conclusion: Interventional nursing can improve visual acuity and intraocular pressure recovery, negative emotions, quality of life, postoperative complications, and satisfaction among patients with senile cataract and glaucoma, and could be promoted in the clinical setting.

Keywords: Interventional nursing, cataract combined with glaucoma, vision recovery, complications

Introduction

Cataract and glaucoma have become the most common blinding eye diseases in elderly patients. Data show that glaucoma is the second leading cause of blindness, and about 20% of patients worldwide develop blindness due to glaucoma; moreover, by 2020, more than 70 million patients worldwide will have glaucoma [1]. The disease is prone to occur in patients aged over 40 years, and its incidence gradually increases with age [2]. Most of the cataracts are caused by aging. Owing to various factors such as slow metabolism, environmental changes, and endocrine disorders, the lens capsule gradually changes from transparent to turbid, resulting in visual impairment [3]. With timely treatment via surgery, cataract can generally be controlled, and the prognosis of patients receiving cataract surgery is better than that of patients with glaucoma [4]. In clinical practice, glaucoma is an acute malignant eye disease with poor reversibility and prognosis. It occurs when the intraocular pressure keeps increasing and is beyond the range of the eyeball, thereby resulting in papillary atrophy, depression, and visual field defect and ultimately leading to blindness in both the eyes [5].

Cataract and glaucoma usually occur alone. However, in recent years, the coincidence of cataract and glaucoma has become common in clinical practice. If treatment is not provided in the early stages of the disease, it can greatly affect a patient's life and be accompanied by various complications, which eventually lead to complete loss of vision [6, 7]. At present, the most effective and common treatment for cataract with glaucoma is phacoemulsification and intraocular lens implantation combined with trabeculectomy [8]. However, owing to the long-term effects of old age, aging of the body, poor psychological tolerance, and a lack of disease awareness among elderly patients, the risk associated with this treatment is high and subsequent surgery is ineffective, thereby resulting in unsatisfactory vision recovery and clinical complications [9]. Therefore, for elderly patients with cataract and glaucoma, safe and effective nursing intervention has become a very important part of clinical practice.

Therefore, this study compared two groups of patients, i.e., the control and intervention groups, and explored the effects of nursing intervention on visual recovery and postoperative complications in patients with senile cataract and glaucoma, excepting to provide a reference for clinical medicine.

Materials and methods

We enrolled 135 patients with cataract and glaucoma. All patients underwent phacoemulsification and were divided into the control and intervention groups. The control group comprised 59 patients with an average intraocular pressure of 22-28 mmHg; there were 26 men and 33 women with age ranging from 55 to 76 years and an average age of 66.54±4.25 years. The intervention group comprised 76 patients with an average intraocular pressure of 23-29 mmHg; there were 28 men and 48 women with age ranging from 53 to 75 years and an average age of 65.87±5.11 years. Patients in the control group were treated using routine nursing measures, and those in the intervention group were treated using targeted interventions together with routine care. This study was approved by the Medical Ethics Committee of the hospital.

Inclusion and exclusion criteria

All the included patients were older than 18 years; cataract and glaucoma all were diagnosed by the 20 years Chief Physician of the ENT and met the diagnostic criteria for cataract in "Ophthalmology" and those for glaucoma in Clinical Glaucoma, and had no mental disorder or communicable disease; were informed of the purpose of the trial (along with their families), agreed to participate, and signed informed consent forms; and had complete clinical data [11, 12].

Patients who had malignant tumors, were unable to undergo surgery, had coagulopathy, had low immune function, and were unable to bear the risk of surgical treatment were excluded.

Nursing methods

Routine nursing care was provided for the control group to meet the basic needs for treatment of the patients. The details are as follows: (1) patients were given hypotensive drugs according to the doctor's advice; (2) they were asked to consume a light diet and avoid spicy food; (3) they were given an intravenous infusion before surgery; (4) an antibiotic susceptibility test was performed in advance; (5) they were asked to assume the correct posture during surgery; (6) after surgery, the patients' posture was changed to prevent the formation of pressure sores; and (7) the room was checked on time daily to observe the patient's condition.

In addition to the nursing care provided to the control group, the intervention group was treated using nursing intervention, including psychological intervention, environmental intervention, preoperative guidance, postoperative guidance, and health education. (1) Psychological intervention: Owing to the lack of knowledge about the disease and the pain caused by the disease symptoms, patients often had obvious anxiety and depression. Additionally, more patience was required when communicating with patients. Most elderly patients were afraid of the surgery and about the results not being satisfactory. Therefore, to alleviate the negative emotions that occurred during the treatment of patients, medical staff needed to enable the patients and their families aware of the details of the disease, share the success stories of surgical cases, encourage patients to actively face the treatment, communicate with them, and be attentive to their needs. The staff also needed to ensure that patients prone to bouts of excite-

ment were prevented from getting too excited, so as to make the patients maintain stable emotions. (2) Environmental intervention: the hospital's environment was introduced to the patients and their family when entering the hospital to prevent the patient from feeling estranged. Most patients with cataracts and glaucoma had special requirements for ward lighting and were admitted to patient-friendly wards to prevent the room from being too dark or too bright. (3) Preoperative guidance: the patient was introduced to his/her surgical plan and the precautions taken during the surgery; the patient's preoperative tension was relieved; the postoperative recovery effect was highlighted, so the patient became more active and optimistic to receive the surgery. The patients were ensured to keep warm; bed-ridden patients were guided to have good bowel movement, and effective breathing. The patients were helped prepare adequately for the surgery to reduce their physical discomfort due to the surgery. They were assisted in cleaning the eyes, and the movements were as gentle as possible to avoid causing any discomfort or increasing any intraocular pressure. (4) Postoperative guidance: the patients were told the surgery time and that the entire surgery would be very smooth, so that the patient would be more confident in undergoing postoperative treatment. Close attention should be paid to the surgical site of the patient to avoid bleeding from the wound. The care providers reported any bleeding to the attending physician and helped the patient change the gauzes. They applied erythromycin eye ointments to the wounds of patients according to the doctor's advice for better wound repair; asked the patients not to squeeze their eyes, bend over, or shake their heads; made sure the patients stay in bed and closely monitored the patients' intraocular pressure. The care providers also provided the patients with light diets, mainly semi-liquid, so that excretion was smooth; assisted them daily to wash the wounds with saline, and applied antibiotic eye drops 4 times to prevent infection. (5) Health education: the patients and their families were informed that although the disease had been controlled via the surgery, later maintenance was especially important. They were educated to reduce the use of the treated eye and to avoid being in the environments that were too bright or dark to avoid recurrence. The patients were asked to avoid any cigarettes and alcohol and try to control their emotions to maintain a relaxed state. They were also asked to raise their pillows when sleeping at night to prevent the heads from being congested or causing an increase in intraocular pressure. Because the elderly patients were prone to constipation, they should be recommended eating more fruits and vegetables and doing exercise properly. They were requested to remember the time of the follow-up visits and take the initiative to conduct a physical examination every 6 months after hospital discharge; to consult a doctor immediately on experiencing physical discomfort. Finally, each patient was given a printed copy of the health education material.

Observation indexes

Main observation indicators: The total incidence of complications and visual recovery such as corneal edema, anterior chamber hemorrhage, positive effusion, elevated intraocular pressure were monitored in the two groups. Visual acuity tests were performed to observe the visual recovery of the two groups of patients before and after care. The Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS) were administered to patients in both groups. The total scores of the two self-rating scales are 100 points. Higher scores indicated more serious depression and anxiety among the patients. The intraocular pressure was monitored before and after treatment using a non-contact benchtop tonometer (Japan SHIN-NIPPON, nct-200).

Secondary observation indicators: quality of life (physical, emotional, cognitive, role, and social) was assessed using the quality of life scale by special personnel for the two groups of patients. The differences in total scores of the two groups were compared, and the satisfaction scores of the two groups were calculated as follows: Satisfaction = (total number - general number)/the total number of people × 100%.

Statistical analysis

In this study, the collected data were statistically analyzed using IBM SPSS Statistics for Windows/Macintosh, Version 20.0; the data and figures were plotted using GraphPad Prism 7, in which count data are expressed as "rate (%)" and were analyzed using the chi-square

Table 1. Analysis of clinical data from the two groups of patients [n (%)]

		Control group (n=59)	Intervention group (n=76)	t/X^2 value	*P* value
Sex	Man	26 (44.07)	28 (36.84)	0.723	0.395
	Woman	33 (55.93)	48 (63.16)		
Age (years)	≥65	32 (54.24)	40 (52.63)	0.034	0.853
	<65	27 (45.76)	36 (47.37)		
Smoking history	Yes	30 (50.85)	35 (46.05)	0.306	0.580
	No	29 (49.15)	41 (53.95)		
History of alcoholism	Yes	10 (16.95)	15 (19.74)	0.171	0.679
	No	49 (83.05)	61 (80.26)		
History of hypertension	Yes	50 (84.75)	62 (81.58)	0.236	0.627
	No	9 (15.25)	14 (18.42)		
Diabetes history	Yes	40 (67.80)	50 (65.79)	0.060	0.806
	No	19 (32.20)	26 (34.21)		
BMI (kg/m^2)		22.65±1.84	22.97±1.62	1.073	0.285
PLT ($10^9/L$)		184.65±25.33	176.94±22.15	1.884	0.062
Hb (g/L)		121.36±10.28	123.84±12.55	1.231	0.221
WBC ($10^9/L$)		4.84±1.75	4.56±1.62	0.962	0.338

Note: BMI, denotes body mass index; HB, hemoglobin; WBC, white blood cell counts.

Table 2. Changes in visual acuity and intraocular pressure in the two groups before and after surgery

Group	Vision		Intra-ocular tension (mmHg)	
	Before nursing care	After nursing care	Before nursing care	After nursing care
Control group (n=59)	0.15±0.08	0.56±0.12*	35.21±1.88	21.14±1.46*
Intervention group (n=76)	0.14±0.08	0.79±0.19*	35.10±1.72	16.72±1.51*
t value	0.720	8.122	0.354	17.115
P value	0.473	0.000	0.724	0.000

Note: *a difference was observed between the groups before and after nursing care (P<0.05).

test. Measurement data are expressed as mean ± standard deviation (means ± SD) and were analyzed using the t test. A statistical difference was indicated when P was <0.05.

Results

Analysis of the clinical characteristics of the two groups of patients

No statistical differences were observed in sex, age, smoking history, alcohol history, hypertension history, diabetes history, body mass index, platelet count, hemoglobin levels, and white blood cell counts between the two groups (P>0.05) (**Table 1**).

Visual acuity recovery and intraocular pressure changes before and after surgery in both the groups

Visual acuity recovery in both groups was observed before and after surgery. The results showed no significant difference in preoperative visual acuity between the intervention and control groups (P>0.05). Postoperative visual acuity of both groups was significantly higher after surgery than before surgery, with a statistical difference (P<0.05). Visual acuity recovery in the intervention group was significantly higher than that in the control group, with a statistical difference (P<0.05). An analysis of the changes in intraocular pressure before and after surgery in the two groups showed no significant difference in preoperative visual acuity between the intervention and control groups (P>0.05). The intraocular pressure of the two groups was significantly lower after surgery than before surgery, with a statistical difference (P< 0.05). The intraocular pressure of the intervention group was significantly lower than that of the control group, with a statistical difference (P<0.05) (**Tables 2** and **3**, and **Figure 1**).

Table 3. Comparison of visual acuity and intraocular pressure difference between the two groups before and after surgery

Group	Control group (n=59)	Intervention group (n=76)	t value	*P* value
Visual acuity variation	0.40±0.10	0.61±0.22	6.803	0.000
Intraocular pressure variation (mmHg)	14.10±2.31	18.37±2.10	11.216	0.000

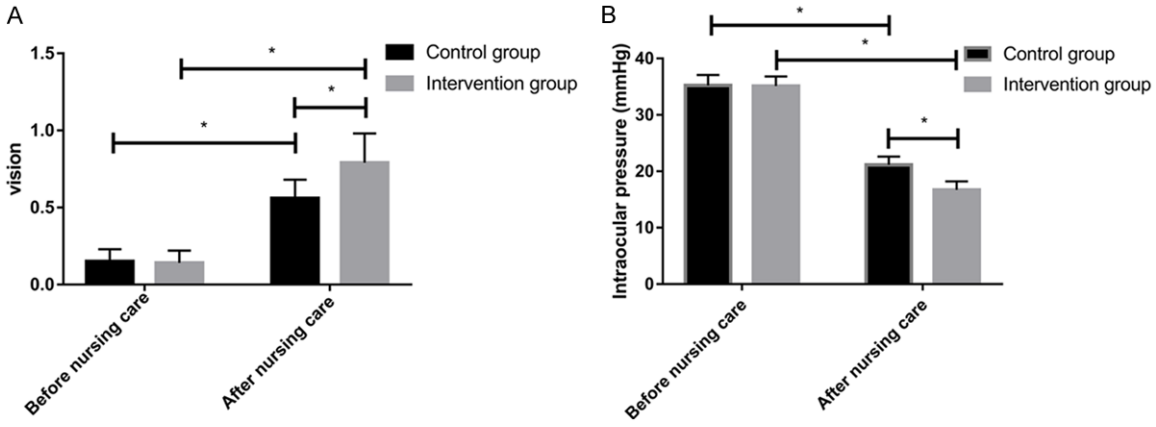

Figure 1. Recovery of intraocular pressure in the two groups of patients before and after nursing care. A. Examination of the eyesight of patients in the two groups. No difference was observed between the two groups before nursing care. Visual acuity in the two groups was significantly higher after nursing care than that before, and the intervention group showed significantly higher visual acuity than did the control group. B. Examination of intraocular pressure in the two groups of patients showed no difference between the two groups before nursing care. The intraocular pressure in the two groups was significantly lower after nursing care than that before, and the intervention group showed significantly lower intraocular pressure than did the control group. *Indicates the difference between the two groups (P<0.05).

Table 4. The SAS and SDS scores before and after nursing care in the two groups

Group	SAS score		SDS score	
	Before nursing care	After nursing care	Before nursing care	After nursing care
Control group (n=59)	50.35±6.52	38.84±4.25*	48.51±5.94	39.41±4.21*
Intervention group (n=76)	49.84±6.39	30.55±3.87*	47.88±5.54	31.54±4.33*
t value	0.460	11.826	0.635	10.602
P value	0.649	0.000	0.527	0.000

Note: *a difference was observed between the two groups before and after nursing care (P<0.05).

SAS and SDS scores before and after nursing care in the two groups of patients

An analysis of the scores of depression and anxiety before and after nursing care in the two groups of patients showed no significant difference in the SAS and SDS scores before treatment (P>0.05).

After nursing care, the SAS and SDS scores in the intervention group were significantly lower than those in the control group (P<0.05), and the decrease in the SAS and SDS scores in the intervention group was significantly higher than that in the control group, with a statistical difference (P<0.05) (**Tables 4** and **5**, and **Figure 2**).

Comparative analysis of the total scores of quality of life before and after nursing care between the two groups of patients

A comparative analysis of the total scores of quality of life before and after nursing care showed no differences between the two groups (P>0.05); the total scores of quality of life increased significantly in both the groups after nursing care. A difference was observed between the two groups (P<0.05); the total scores of quality of life of the intervention group were

Table 5. Comparison of SAS and SDS score differences between the two groups before and after nursing care

Group	Control group (n=59)	Intervention group (n=76)	t value	*P* value
SAS score change	9.27±6.62	19.94±6.41	9.457	0.000
SDS score change	9.31±6.91	15.56±7.70	4.890	0.000

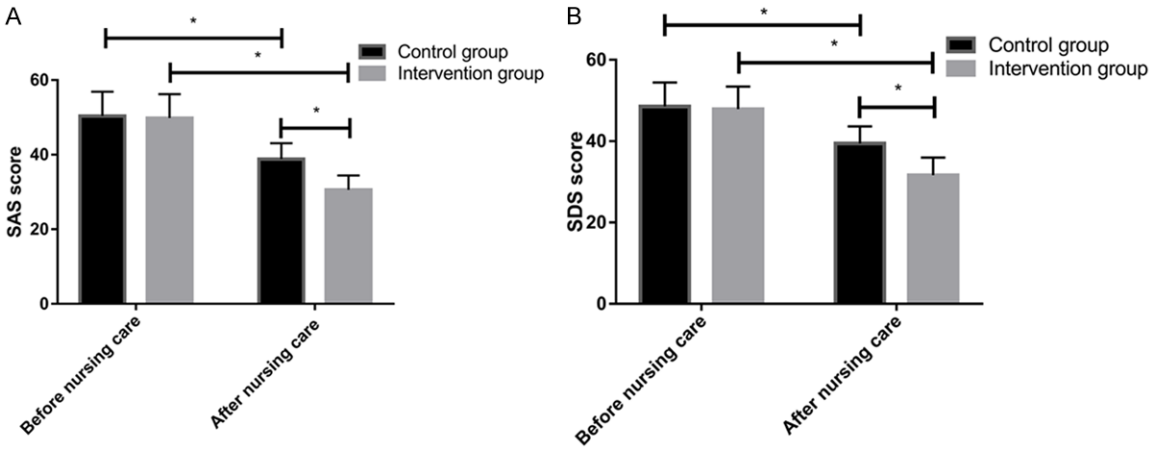

Figure 2. Comparison of the changes in the SAS and SDS scores before and after nursing care in the two groups of patients. A. Nursing insurance. The SAS scores of the two groups were significantly lower after nursing care than that before, with statistical differences. The SAS scores in the control group were significantly higher than those in the intervention group. No difference in the SDS score was observed between the two groups. B. Nursing insurance. The SDS scores in the two groups were significantly lower after nursing care than that before, and a difference was found in the SDS score of the control group after nursing care. *indicates the difference between the two groups (P<0.05).

Table 6. Comparison of the quality of life before and after nursing care in the two groups of patients

Group	Before nursing care	After nursing care	t value	*P* value
Control group (n=59)	312.53±13.25	345.84±12.85	13.862	0.000
Intervention group (n=76)	310.22±12.54	392.45±13.54*	38.844	0.000

Note: *a difference was observed between the control and intervention groups after nursing care (P<0.05).

Table 7. Comparison of the difference in the total score of quality of life between the two groups before and after nursing care

Group	Control group (n=59)	Intervention group (n=76)	t value	*P* value
Variable quantity	35.72±18.28	83.48±17.78	15.301	0.000

significantly higher than those of the control group, with a statistical difference (P<0.05) (**Tables 6** and **7**, and **Figure 3**).

Comparative analysis of the total incidence of postoperative complications and satisfaction with nursing care between the two groups

An analysis of the total incidence of postoperative complications in the two groups showed that the incidence was significantly lower in the intervention group than in the control group, with a statistical difference (X^2=4.100, P=0.043). The analysis of the patient satisfaction with nursing care table filled out by the two groups of patients showed that the patient satisfaction rate was significantly lower in the control group than in the intervention group, with a statistical difference (X^2=6.022, P=0.014) (**Tables 8** and **9**).

Discussion

As the most common diseases causing blindness, cataract and glaucoma tend to occur in elderly patients, and glaucoma has become

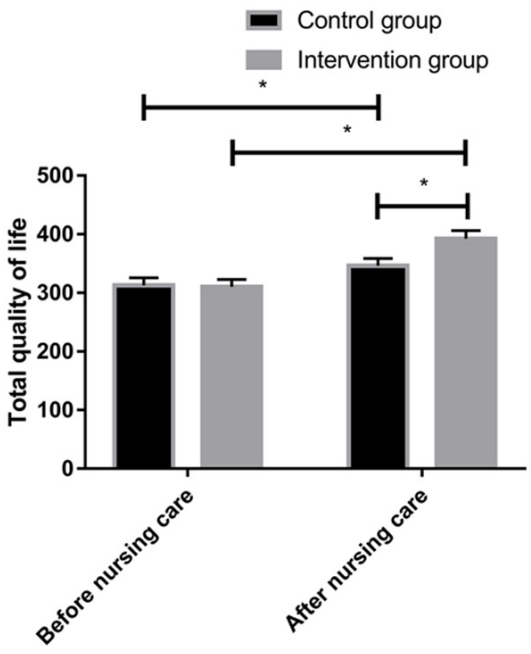

Figure 3. Total score of quality of life of the two groups of patients showed no significant difference before nursing care. After nursing care, the total scores of quality of life in the two groups of patients increased significantly, and the increase in the control group was lower than that in the intervention group. *indicates the difference between the two groups ($P<0.05$).

one of the three major diseases that cause blindness in humans [10, 11]. The number of elderly patients with cataract and glaucoma has been increasing; these diseases bring great inconvenience to the patients and seriously affect their quality of life [12]. Previous studies have shown that the main causes of morbidity or exacerbation of glaucoma and cataract are excessive fatigue, emotional instability, insomnia, prolonged stay in a dark environment, etc [13]. Negative emotions such as depression, anxiety, and irritability, affect the patient's central nervous system, which disturbs the balance of the internal environment and induces a series of pathological changes such as an increase in intraocular pressure [14].

Because elderly patients do not pay attention to the symptoms and do not seek timely medical treatment, diseases usually reach an advanced stage by the time they are discovered, thereby delaying adequate medical treatment. Because of the rapid onset of cataract with glaucoma and the high risk of blindness, no effective and specific drug is available in clinical practice. Therefore, surgery is the most important treatment [15].

Considering the physiological and psychological conditions of elderly patients, the gradual decline of their organ function and immunity, and the increasing difficulty in performing surgery, rapid restoration of the patients' vision while avoiding postoperative complications would require scientific and effective nursing measures to enable the patients to maintain a good attitude and actively face the treatment.

The intervention used in the current experiment aimed to treat patients through psychological intervention, environmental intervention, preoperative guidance, postoperative guidance, and health education [16, 17]. Studies have shown that interventional care plays a significant role in improving the prognosis of and reducing complications in patients undergoing treatment, but it remains unclear whether it is effective in treating patients with cataract and glaucoma [18]. Therefore, our study explored the incidence of visual acuity recovery and postoperative complications in patients who underwent cataract surgery together with glaucoma surgery, to provide a reference for future clinical treatment.

In this study, we divided the patients into the intervention and control groups, and provided them different nursing care methods. We found that interventional nursing resulted in significantly improved postoperative recovery of intraocular pressure and visual acuity in the intervention group. Lu showed that nursing intervention has a desirable effect on patients' vision recovery and on lowering intraocular pressure, which is consistent with our findings [19]. The benefits of nursing intervention could be attributed to several factors, e.g., the nurses help massage the patients' eyes and play soothing light music for the patient, which prevents the patients from overstressing the central nervous system; moreover, the nurses ensure the patients consume foods rich in vitamins and trace elements [20]. We also evaluated the patients' anxiety, depression, and quality of life, and found that the scores of the control group were significantly lower than those of the intervention group, which indicated that nursing intervention can improve the negative emotions of patients and

Table 8. Incidence of postoperative complications in both groups [n (%)]

Group	Corneal bedewing	Hyphema	Forward exudation	Bulbi hypertonia	Amount to
Control group (n=59)	2 (3.39)	3 (1.69)	2 (3.39)	1 (5.08)	8 (13.55)
Intervention group (n=76)	1 (1.32)	1 (1.32)	0 (0.00)	1 (1.32)	3 (3.95)

Table 9. Satisfaction with postoperative nursing care in both groups [n (%)]

Group	Very satisfied	Satisfied	Same as
Control group (n=59)	13 (22.03)	26 (44.07)	20 (33.90)
Intervention group (n=76)	30 (39.47)	34 (44.74)	12 (15.79)

their quality of life. Xu showed that nursing intervention had a good therapeutic effect on anxiety, depression, and quality of life of patients after gynecologic tumor surgery [21]. In the process of providing nursing care, elderly patients are prone to a series of psychological characteristics such as nervousness, fear, impatience, and pessimism. These characteristics worsen the patients' condition. To prevent this, we need to establish a good relationship with the patient, attend to the patients' needs, answer their questions, adopt a targeted care plan, relieve their fear and anxiety, and maintain a good state for treatment [22, 23].

At the end of the study, we evaluated the patients' complications and care satisfaction. The occurrence of postoperative complications greatly affects the postoperative healing and treatment of patients, and serious illness may endanger the patients' life. Our statistical analysis showed that the incidence of complications in the intervention group was significantly lower than that in the control group receiving general nursing care, and a statistical difference indicated that nursing intervention had a significant impact on reducing the incidence of postoperative complications. Reducing the incidence of postoperative complications avoids the necessity of secondary treatment and reduces the patients' medical expenses, both of which play an important role in improving the patients' satisfaction with nursing care [24, 25].

Nevertheless, our study has some limitations. The main limitation is that we did not follow-up the patients. It remains unclear whether other factors affect the patients' condition after surgery. Moreover, whether our small sample size biased the results requires further verification. Therefore, future studies with long-term or short-term follow-ups and larger sample sizes are warranted to verify the findings of this study.

In summary, nursing intervention has a greater effect than does general nursing care on restoring vision and intraocular pressure in elderly patients with cataract and glaucoma, improving their negative emotions, quality of life, postoperative complications, and satisfaction. Therefore, nursing intervention should be promoted in clinical practice.

Disclosure of conflict of interest

None.

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