

## Original Article

# The influence of comprehensive nursing intervention on the compliance of glaucoma patients with their doctors' advice

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**Abstract:** Objective: To determine the effect of targeted comprehensive nursing on the compliance of glaucoma patients with their doctors' advice. Methods: A total of 78 patients with glaucoma admitted to the Ophthalmology Department of the First Affiliated Hospital of Hainan Medical University were retrospectively enrolled and assigned to a routine nursing group and a comprehensive nursing group according to the different nursing modes each patient underwent. The routine nursing group underwent routine nursing, and the comprehensive nursing group underwent comprehensive nursing intervention. The causes of not following their doctor's advice among the two groups were evaluated, and the two groups were compared in terms of their compliance rates after the intervention and quality of life and psychological state before and after the intervention. Results: The causes of not following the doctor's advice were mainly classified into three categories: physiological, psychological, and comprehensive factors. Before the nursing intervention, the two groups were not significantly different in their quality of life scores or their psychological states (both  $P > 0.05$ ). After the nursing intervention, the intraocular pressure values (IOP), the visual field pattern standard deviations (PSD), the cup/disk area ratios (C/D AR), the mean retinal nerve fiber layer thicknesses (mRNFLT), and the other indexes in the comprehensive nursing group were significantly better than they were in the routine nursing group, and the comprehensive nursing group showed notably better quality of life and psychological states and a notably higher compliance rate than the routine nursing group (all  $P < 0.05$ ). Conclusion: Targeted comprehensive nursing can help glaucoma patients correct bad behaviors, improve their compliance rates and quality of life, and alleviate their negative emotions.

**Keywords:** Comprehensive nursing intervention, glaucoma, behavior of following the doctor's advice, influence

## Introduction

Glaucoma is an eye disease caused by optic nerve damage. It results in lifelong irreversible damage to the eyes such as a decrease in both visual acuity and effective field of view [1-3]. As the disease progresses, the patient's intraocular pressure (IOP) continues to rise, which may give rise to optic atrophy and visual field defects, and even blindness in severe cases [4]. Limited by the current medical treatments available, there is no complete cure for glaucoma, but in clinical practice, relevant therapy can be used to block further damage to the optic nerve, and thereby relieve the patient's condition. Effective treatment can strongly control the acute symptoms of patients with glaucoma [5]. But most patients stop taking their

drugs, take drugs against their doctor's advice, ignore their doctor's advice, or fail to attend their return visits on time when they think their symptoms are relieved after discharge, so their IOP will be ineffectively controlled, so their glaucoma eventually develops into secondary glaucoma [6]. How to effectively improve the patients' compliance with doctor's advice after surgery, so that they can complete their self-care according to their doctor's advice has become a hot research issue in clinical nursing work in recent years. Comprehensive nursing intervention is a novel procedure-centered nursing service with systematic clinical nursing procedures, which aims to integrate the advantages of responsibility-based nursing and group nursing while ensuring the level and quality of nursing services. A large number of studies

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have shown that comprehensive nursing intervention plays an important role in improving patients' quality of life and reducing nursing risk events [7]. Therefore, this study analyzed the positive influences of comprehensive nursing intervention on the compliance of glaucoma patients with their doctors' advice, with the goal of providing information on improving the rehabilitation of such patients.

## Materials and methods

### *General data*

A total of 78 patients with glaucoma admitted to the ophthalmology department of our hospital were retrospectively enrolled in this study. They were assigned to a routine nursing group or a comprehensive nursing group (n=39 in each group) according to different nursing method each patient underwent. The routine nursing group underwent routine nursing, and the comprehensive nursing group underwent comprehensive nursing intervention. This study was approved by the Ethics Committee of our hospital.

### *Inclusion and exclusion criteria*

**Inclusion criteria:** (1) Patients who were diagnosed with acute angle-closure glaucoma through imaging examinations and who underwent trabeculectomy filtration surgery or laser/surgery with peripheral iridectomy or iridectomy. (2) Patients between 30 and 70 years old (male or female). (3) Patients with an IOP between 10-21 mmHg at admission. (4) Patients with a clear consciousness who were able to undergo health education and follow-up. (5) Patients willing to cooperate with the scales-based evaluation.

**Exclusion criteria:** (1) Patients who met the relevant diagnostic standards and surgical standards, but who had an IOP lower than 10 mmHg or higher than 21 mmHg during their hospitalization. (2) Patients with disturbances of consciousness or mental diseases. (3) Patients unwilling to cooperate with the study or unable to complete the follow-up. (4) Patients without complete clinical data.

### *Methods*

For the routine nursing group: At admission, each patient underwent routine nursing mea-

asures and health education, including routine diet care, vital sign monitoring during the treatment, and medication guidance. In addition, the nursing staff were set up to promptly explain the glaucoma-related information, the treatment plans, the adverse reactions, and the precautions to each patient and his/her family.

For the comprehensive nursing group: Each patient underwent comprehensive nursing intervention at admission as follows: (1) The establishment of a nursing team [8]. The team was arranged to sort out and analyze the data about all the patients and formulate comprehensive nursing intervention measures according to each patient's disease progression. The team was also arranged to establish a salon for mutual help, analyze the patients' compliance rates and related influencing factors, determine the influencing factors for poor compliance behavior, and carry out corresponding nursing intervention measures with these factors as the starting point of the nursing service. (2) Cognitive intervention: In terms of health education on disease-related information, the nursing staff were set up to explain the glaucoma-related information such as the eye structure, the disease symptoms, the surgical treatment plans and the self-care methods of eyes to patients to improve their understanding of the disease and to help them understand the necessity of cognitive intervention, so that they would willingly accept the intervention. Additionally, the nursing staff were set up to teach the patients how to check their IOP by themselves and required them to measure and record it every day. The nursing staff were also trained to teach the patients how to use eye drops correctly, matters needing attention during the use of the drops, and measures to handle side effects of the drugs. Moreover, the staff was required to guide the patients in mastering more than 2 eye-massage methods through explanation and operation so that they were able to massage themselves every day. Additionally, the nursing staff were prepared to carry out cognitive interventions to improve the patients' and their families' understanding of the glaucoma-associated information, and to inform them of the daily precautions and self-care knowledge to enable them to understand fully and systematically the glaucoma-associated information. (3) Behavior intervention: Some patients had bad eye care habits, so the nursing staff was required to help them stop such

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habits, and informed them of the importance of correct living habits and helped them develop good ones. The patients were required to follow the suggestions: Eat more digestible and nutritious food to get higher body metabolic capacity and avoid increasing their IOP levels caused by constipation, to have a reasonably controlled amount of drinking water (not more than 1500 mL each day) to avoid aqueous humor pressure caused by excessively drinking water, to quit smoking and drinking alcohol, and to avoid coffee, strong tea and other foods that can excite the central nervous system, and to pay attention to rest. Patients with glaucoma who suffered from poor sleep were encouraged to soak their feet with warm water before going to bed and to keep mentality as calm as possible and avoid excitement. (4) Family intervention: A large number of studies have shown that positive family cooperation and social support can improve patients' confidence in overcoming diseases. Glaucoma is hereditary, so patients' immediate families are also likely to have glaucoma. Therefore, their family members were also required to participate in learning glaucoma-related knowledge. Their family members received examinations regularly regardless of their symptoms, so that their abnormal conditions could be found as early as possible and so that early diagnosis and early treatment could be achieved among them to improve the treatment effect. (5) Psychological intervention: Before the psychological intervention, the nursing staff were arranged to help the patients understand the significance of good emotions in improving the treatment effect and the adverse effects of bad emotions on their treatment. Patients with glaucoma are prone to fear, anxiety, depression, tension, and other negative emotions because their visual acuity is affected. These negative emotions will compromise their compliance with the medical treatment and the clinical effectiveness. Therefore, the nursing staff were asked to guide the patients in venting these negative emotions according to their traits to relieve their psychological pressure. Moreover, the patients were encouraged to participate in beneficial social activities, make more good friends, and thus keep happy and suffer a lower recurrence rate. (6) Comfort nursing: The nursing staff were asked to provide a quiet and comfortable environment for the patients after their admission. Because the patients' visual acuity was affected, it was necessary to avoid too many indoor

items that would hinder their movement. After the operations, the nursing staff were instructed to fully explain the daily precautions to the patients, and to tell them not to touch their eyes or the surrounding skin, and they absolutely must not shake their heads violently. For possible complications such as headache, it was necessary to provide timely prevention and treatment measures for the patients to improve their self-care abilities.

### *Outcome measures*

(1) General data: A self-made general data questionnaire was used in the general data survey, which mainly covered the basic patient information: Gender, age, education level, marital status, monthly income, and stage of the disease.

(2) Behavior regarding following the doctor's advice: A questionnaire on following the doctor's advice among the patients with glaucoma was used to evaluate their compliance. The scale has 6 components and uses a three-grade scoring method; the score is positively associated with the compliance level [9]. The compliance rate of a group = (the number of patients following doctor's advice in the group/ the total number of patients) \*100%.

(3) Factors influencing not following the doctor's advice: A questionnaire covering the factors influencing not following the doctor's advice was used to investigate the reasons for such behaviors in the two groups [10]. The questionnaire was developed to evaluate the reasons based on the patients' physiology, psychology, and other factors, with 12 items, by using a two-level scoring method (yes and no). According to the test-retest reliability, the correlation coefficient at an interval of two weeks is between 0.7-0.9, which indicates that the questionnaire has a good stability over time.

(4) At three months after discharge, the IOP, visual field, and Heidelberg Retina Tomograph (HRT-III) parameter levels were compared between the two groups.

(5) Psychological state: The self-rating anxiety scale (SAS) and the self-rating depression scale (SDS) were used to evaluate the psychological states of the two groups before the treatment and at 3 months after discharge [11]. The scores are both negatively correlated with psy-

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**Table 1.** General information

	Routine nursing group		Comprehensive nursing group		$\chi^2$	P
	n	Proportion	n	Proportion		
Gender					2.531	0.691
Male	28	71.79%	26	66.67%		
Female	11	28.21%	13	33.33%		
Age (years)					1.953	0.804
<45	10	25.64%	9	23.08%		
45-60	14	35.90%	16	41.03%		
>60	15	38.46%	14	35.90%		
Marital status					2.069	0.747
Married	28	71.79%	30	76.92%		
Unmarried or divorced	11	28.21%	9	23.08%		
Education level					1.995	0.785
Junior high school and below	8	20.51%	7	17.95%		
Technical secondary school and high school	21	53.85%	20	51.28%		
College degree and above	10	25.64%	12	30.77%		
Monthly income (RMB)					0.978	0.894
<2,000	9	23.08%	7	17.95%		
2,000-4,000	19	48.72%	20	51.28%		
>4,000	11	28.21%	12	30.77%		
Stage of disease					1.786	0.806
Preclinical	11	28.21%	10	25.64%		
Prodromal period	4	10.26%	4	10.26%		
Remission period	17	43.59%	15	38.46%		
Absolute period	4	10.26%	5	12.82%		
Chronic phase	3	7.69%	5	12.82%		
Preoperative IOP (mmHg)					1.934	0.733
30-40	22	56.41%	21	53.85%		
40-50	17	43.59%	18	46.15%		

Note: IOP: intraocular pressure.

chological state. A SAS score higher than 50 points indicates anxiety, and a SDS score higher than 53 indicates depression.

(6) Quality of life: The General Quality of Life Inventory-74 (GQOU-74) was used to evaluate the patients' quality of life before the treatment and at 3 months after discharge [12]. With 4 components, the scale runs between 0 and 100 points, and the score is positively correlated with quality of life.

### Statistical analysis

SPSS 20.0 statistical software was used to analyze the experimental data in each group. The general data and the various index levels of the patients with glaucoma in the two groups

were expressed as the means  $\pm$  standard deviation ( $\bar{x} \pm sd$ ), and the comparisons of the enumeration data and the measurement data between the groups were conducted using independent T tests and chi-square tests, respectively.  $P < 0.05$  was deemed a significance difference.

### Results

#### General data

Before the intervention, the general data in the two groups were compared and analyzed. It was found that the two groups had basically similar baseline data at the time of admission (all  $P > 0.05$ ), so the two groups were comparable (**Table 1**).

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**Table 2.** The rate of following doctor's advice after discharge (score)

Item	Routine nursing group	Comprehensive nursing group	t	P
Avoiding recurrence	1.63±0.23	2.32±0.32	3.983	0.039
Cognition of disease	1.64±0.26	2.35±0.26	3.591	0.042
Medication compliance	1.58±0.25	2.41±0.24	3.962	0.028
Actively seeking treatment	1.55±0.27	2.38±0.21	4.008	0.025
Self-testing after discharge	1.58±0.24	2.42±0.22	4.042	0.021
Regular reexamination	2.04±0.26	2.08±0.26	0.481	0.744
Following doctor's advice rate (%)	69.23	87.18	3.686	0.045

**Table 3.** Analysis of the factors affecting the non-compliance behavior of the patients after discharge (n=78)

	n	Rate
Physiological factors		
Advanced age	27	34.62%
Decline in physiological function	31	39.74%
Headache and dizziness	5	6.41%
Poor sleep quality	8	10.26%
Other (eye discomfort)	4	5.13%
Psychological		
Lack of confidence in treatment	15	19.23%
Weak will	22	28.21%
Inability to adapt to visual impairment	27	34.62%
Other comprehensive		
Lack of disease awareness	15	19.23%
Insufficient attention from family members	17	21.79%
Economic reasons	11	14.10%
Distrust treatment options	9	11.54%
Inadequate eye care after surgery	10	12.82%

### Behavior of following doctor's advice

Compared with the routine nursing group, the comprehensive nursing group got notably better scores in the indices, including avoiding recurrence, understanding of the disease, medication compliance, actively seeking treatment, and self-testing after discharge (all  $P < 0.05$ ). There was no notable difference between the two groups in terms of reexaminations ( $P > 0.05$ ), but according to our comparison of the two groups in terms of their overall compliance rates after discharge, the overall compliance rate of the comprehensive nursing group was significantly higher than it was in the routine nursing group ( $P = 0.045$ ; **Table 2**).

### Reasons for not following the doctor's advice

By analyzing the reasons for not following doctor's advice in the two groups, it was found that

the current influencing factors of such behavior in clinical practice mainly included three aspects: physiological, psychological, and other comprehensive factors. The main factors affecting the non-compliance behavior of the patients were a decline in physiological function, advanced age, inability to adapt to visual impairment, and a weak will (**Table 3**).

### Nursing efficacy

*IOP and visual field:* At three months after the discharge, the IOP and PSD levels of the comprehensive nursing group were significantly better than the corresponding levels in the routine nursing group (both  $P < 0.05$ , **Table 4**).

*HRT-III:* According to comparison results of HRT-III parameters between the two groups at 3 months after discharge, the cup/disk area ratio (C/D AR) and the mean retinal nerve fiber layer thickness (mRNFLT) levels in the comprehensive nursing group were significantly better than they were in the routine nursing group (both  $P < 0.05$ ), but there were no significant differences in the other parameters between the two groups (all  $P > 0.05$ ; **Table 5**).

*Psychological state:* Before the nursing intervention, there was no significant difference between the two groups in terms of their SAS and SDS scores (both  $P > 0.05$ ). After the nursing intervention, the psychological states in both groups were improved compared with the states before the nursing intervention ( $P < 0.05$ ), but the improvement in the comprehensive nursing group was more significant (both  $P = 0.001$ , **Tables 6, 7**).

*Quality of life:* Before the nursing intervention, there was no significant difference between the two groups in terms of their quality of life scores (all  $P > 0.05$ ). After the nursing intervention, the



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**Table 4.** Comparison of IOP and visual field between the two groups at 3 months after discharge

	IOP (mmHg)	MD	PSD
Routine nursing group	14.18±3.14	-11.67±2.15	4.29±0.25
Comprehensive nursing group	12.62±2.88	-11.11±2.06	4.02±0.23
t	2.854	1.074	2.315
P	0.041	0.556	0.033

Note: IOP: intraocular pressure value; PSD: pattern standard deviation.

**Table 5.** Comparison of HRT-III parameters between the two groups at 3 months after discharge

	Routine nursing group	Comprehensive nursing group	t	P
DA (mm <sup>2</sup> )	2.71±0.36	2.90±0.34	2.044	0.051
CA (mm <sup>2</sup> )	1.36±0.28	1.27±0.25	1.748	0.207
RA (mm <sup>2</sup> )	1.62±0.23	1.55±0.27	1.793	0.195
CV (mm <sup>2</sup> )	0.79±0.11	0.73±0.12	0.664	0.756
C/D AR	0.63±0.05	0.57±0.07	2.844	0.038
C/D LR	0.73±0.11	0.69±0.08	0.842	0.521
MaxCD (mm)	0.83±0.15	0.89±0.12	1.097	0.144
mRNFLT (mm)	0.18±0.03	0.15±0.02	2.065	0.048
CSM	1.34±0.08	1.36±0.07	0.434	0.795

Note: DA: disk area; CA: cup area; RA: rim area; CV: cup volume; RV: rim volume; C/D AR: cup/disk area ratio; C/D LR: linear cup/disk ratio; maxCD: maximum cup depth; mRNFLT: mean retinal nerve fiber layer thickness; CSM: cup shape measure.

**Table 6.** The SAS scores of the two groups of glaucoma patients before and after the nursing intervention ( $\bar{x}\pm sd$ )

	Before nursing	After nursing	t	P
Routine nursing group	58.48±5.63	47.59±4.78	5.915	0.035
Comprehensive nursing group	58.81±5.85	39.48±4.13	9.041	0.001
t	1.341	8.674		
P	0.457	0.006		

Note: SAS: self-rating anxiety scale.

**Table 7.** The SDS scores of the two groups of glaucoma patients before and after the nursing intervention ( $\bar{x}\pm sd$ )

	Before nursing	After nursing	t	P
Routine nursing group	56.48±4.25	44.61±5.07	5.143	0.031
Comprehensive nursing group	56.14±5.07	37.44±5.01	9.018	0.001
t	1.756	7.909		
P	0.391	0.009		

Note: SDS: self-rating depression scale.

quality of life scores in both groups in all dimensions were improved ( $P<0.05$ ), and the improve-

ment in each dimension in the comprehensive nursing group was notably better than it was in the routine nursing group ( $P<0.05$ , **Table 8**).

### Discussion

The behavior of following the doctor's advice refers to the situation where the patients follow and cooperate with the doctor's advice after seeing a doctor, which is mainly manifested in the compliance with the medical plan and the preventive intervention measures [12]. Related studies have found that a considerable number of patients with glaucoma stop taking their drugs, or they take drugs by going against the doctor's advice, or they ignore their eye care, or they fail to go to their return visits on time when they feel their symptoms are relieved after the treatment. Such behaviors disrupt the continuous treatment of glaucoma and the effective control of IOP and visual acuity, resulting in secondary glaucoma and even blindness [13, 14]. Therefore, it is imperative to take effective nursing intervention measures for patients with acute glaucoma.

According to the results in this study, the compliance rates of the comprehensive nursing group and the routine nursing group were 87.18% and 69.23%, respectively, which are similar to the results of related studies [15]. The results indicated unsatisfactory compliance with the doctor's advice among the glaucoma patients in clinical practice. There are many factors that compromise the behavior of following doctor's advice among patients with glaucoma,

and they can be classified into physiological, psychological, and other comprehensive fac-

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**Table 8.** Analysis of the quality of life of the two groups of glaucoma patients before and after the nursing ( $\bar{x} \pm sd$ )

	Before nursing		After nursing	
	Routine nursing group	Comprehensive nursing group	Routine nursing group	Comprehensive nursing group
Physical function	60.38±8.33	60.41±8.18	66.49±10.73 <sup>#</sup>	75.39±8.34 <sup>#,*</sup>
Mental function	62.36±6.81	61.96±7.06	70.58±7.51 <sup>#</sup>	78.83±6.93 <sup>#,*</sup>
Social function	57.35±7.46	57.05±7.34	63.48±6.16	70.49±8.66 <sup>#,*</sup>
material life	55.35±6.95	55.84±6.41	58.48±6.46	60.85±6.95 <sup>#,*</sup>
Total average	58.86±6.87	58.82±7.26	64.75±7.58 <sup>#</sup>	71.39±7.81 <sup>#,*</sup>

Note: Compared with before the nursing, <sup>#</sup>P<0.05; compared with after the nursing in the routine nursing group, <sup>\*</sup>P<0.05.

tors, mainly including: (1) Patients have bad daily habits in eye use, diet, behavior, and sleep and strong emotional volatility, which brings them into a situation with a higher risk of disease recurrence. (2) Due to their long-term illness, the patients are likely to forget to regularly go to hospitals for follow-up, and they eventually miss the doctor's timely adjustment of the treatment plan according to their condition [16]. (3) Most patients with glaucoma are relatively old, with memory loss, so they are prone to forget to take their medication. In addition, the decline in physiological function also lowers the therapeutic effects of the drugs. (4) Long-term treatment brings a certain economic burden to the patients' families, and it also increases the psychological pressure on the patients, resulting in abnormal mood fluctuations, which are likely to lead to the acute onset of glaucoma and form a vicious circle.

In our study, the results showed that before the intervention, the quality of life scores of the patients with glaucoma in all dimensions were relatively low, which is consistent with the research results of Ni et al. [17]. The results indicate that without a sufficient mastery of disease-related knowledge, self-management ability and skills, glaucoma patients have difficulties in positively facing the adverse effects of visual function damage on their daily life, so the doctors and nurses in the ophthalmology department should pay attention to the delivery of health knowledge to these patients to help them change their lifestyles and develop better self-care abilities [18]. After the nursing intervention, the quality of life scores in the two groups were significantly improved, and the scores in the comprehensive nursing group were significantly higher than the scores in the

routine nursing group, indicating that the patients in the comprehensive nursing group had begun to consciously adjust their lifestyles and gradually adapted to the new one, and thus they enjoyed a significantly improved quality of life. In addition, it was found that comprehensive intervention for patients can ensure that the patients can receive comprehensive, systematic and personalized health education, so that they can have a comprehensive and in-depth understanding of their glaucoma-related knowledge, establish correct health beliefs, and thus follow the doctor's advice better. Comprehensive nursing intervention can help the patients change their bad behaviors and living habits, give them full supervision and help, provide seamless medical care services for them, and prompt them and their families to follow their doctor's advice, which is of positive significance in controlling diseases. Under the comprehensive nursing mode, a salon for mutual help is established to provide nursing service and related help for patients during their hospitalization and after discharge, so that the patients can still enjoy efficient, sound and continuous nursing service after discharge, and they will have a sense of being cared for, which has positive significance for disease control, psychological pressure relief and family economic burden reduction of patients [19-21]. After comprehensive nursing intervention, the SAS and SDS scores in the comprehensive nursing group decreased from 58.81±5.85 and 56.14±5.07 to 39.48±4.13 and 37.44±5.02, respectively, indicating that the patients in the comprehensive nursing group had notably better psychological states and notably fewer negative emotions, which could further improve their quality of life. According to the results of our study, at three months after discharge, the

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IOP of the comprehensive nursing group was significantly lower than it was in the routine nursing group, and the other eye function index levels in the comprehensive nursing group were also better than those in the routine nursing group. The results indicated that the patients in the comprehensive nursing group could actively take eyesight protection measures and cooperate with the treatment work every day, so they achieved a better rehabilitation effect.

In this study, a salon for mutual help was introduced as a new intervention measure, which diverts the nursing service object to patients and avoids the situation that traditional nursing intervention only focuses on disease rehabilitation. Additionally, the nursing intervention object of this study is not only the patients, but also extends to the patients' families. Intervening with the patients and their families at the same time is beneficial to improving the families' ability to supervise and care for the patients.

However, in this study, the short study time, the small sample size, and the limitation to hospitalized patients and their families caused a certain limitation of the results, so whether comprehensive nursing intervention measures can be extended to a larger scope need further verification. In addition, the follow-up time was short, so, long-term follow-up observation is required for a further understanding of the intervention effect of comprehensive nursing.

To sum up, the factors related to not following doctor's advice can be classified into psychological, physiological, and other comprehensive ones, and comprehensive nursing intervention focusing on these factors may improve the patients' compliance rates and help them attain a continuous treatment effect and enjoy a better quality of life.

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### Disclosure of conflict of interest

None.

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