

Effects of Patient Education and Compliance on Vision-Related Quality of Life in Glaucoma: A Comparison of Preservative-Free and Conventional Eye Drops

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Abstract: Glaucoma is relatively common in older adults. This neurodegenerative disorder builds up pressure within the eyes causes damage to optic nerve. Dry eyes were the mostly occurred ocular surface disease in 46% patients, followed by allergic conjunctivitis 22% patients, forgetfulness, cost is one of the barriers, Only 25 % of patients has Excellent knowledge about risk factors, causes & symptoms, 60 % of patients were regularly used their eye drops & doing their activities to control glaucoma, 98% of patients statements which implies that the patients have quiet good benefits by using their eye drops. The quality of life for glaucoma patients has shown significant improvement in several areas after giving patient education, including their overall health, concerns about pain, and vision issues. Patients have reported enhanced ability to engage in activities such as reading, performing daily tasks, and going outdoors. The number of patients reporting these improvements has increased from the baseline visit to the first and second follow-up reviews. Compared to preserved eye drops, preservative free eye drops are significantly less associated with ocular symptoms and signs of irritation and also preservative free eye drops are slightly costlier than preserved eye drops. The addition of the necessary number of clinical pharmacists can enhance patient compliance, reduce medication errors, and improve patient counselling and adherence monitoring, particularly for those with long-term eye diseases.

Keywords: IOP, VFQ-25.

Research Paper

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How to cite this paper:

Srinivasan A *et al* (2026). Effects of Patient Education and Compliance on Vision-Related Quality of Life in Glaucoma: A Comparison of Preservative-Free and Conventional Eye Drops. *Middle East Res J. Pharm. Sci.* 6(2): 25-30.

Article History:

| Submit: 11.04.2026 |

| Accepted: 14.05.2026 |

| Published: 16.05.2026 |

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INTRODUCTION

Glaucoma is defined as a group of diseases, which have in common an abnormal elevation of intraocular pressure [IOP] together with the anatomic and functional changes resulting from the abnormal pressure. [1].

MANAGEMENT OF GLAUCOMA

There are several types of glaucoma treatment, including medicated eye drops, micro-surgery, laser treatments and other eye surgery. It's important to realize that glaucoma treatments may prevent additional vision loss, but they will not restore vision already lost to the disease. The main aim of therapy in glaucoma management is reduction of IOP. Depending upon the type, severity and responsiveness of your glaucoma to treatment, [2]. QoL is addressed when assessing a patient's wellbeing, visual function and level of satisfaction with their care. Quality of life concerns are frequently considered in making clinical decisions. [3] Cost effective analysis is used to compare two or more

treatment options for a specific condition. Cost effectiveness is depended on the value in non-monetary terms that is placed on the outcome in relation to the cost. This analysis compares the unit of effectiveness ie., number of years of life saved, number of lives saved, [4] A questionnaire designed to assess adherence with glaucoma therapy. This questionnaire will show good repeatability, as well as content, construct and predictive validity, for glaucoma adherence. GTCAT, a measure based on the HBM [Health Belief Model]. [5].

AIM AND OBJECTIVES

Aim

The aim is to Evaluate the knowledge and medication adherence and its impact on quality of life in glaucoma with a comparison on conventional eye drops and preservative free eye drops.

Primary Objectives

- To assess the glaucoma patient's knowledge, compliance and medication adherence on

glaucoma with quality of life in glaucoma patients

- To assess impact of knowledge and medication adherence in quality of life in glaucoma patients.

Secondary Objectives

- To assess and compare the cost effectiveness of conventional and preservative free eye drops.

METHODOLOGY

This prospective interventional study was conducted among 400 patients attending selected eye hospitals between October 2023 and February 2025. Patients diagnosed with glaucoma and meeting the study's eligibility criteria were enrolled after obtaining informed consent.

Data Collection Demographic and clinical characteristics were collected using a structured data collection form. Patients' knowledge and treatment compliance regarding glaucoma were assessed using the Glaucoma Treatment Compliance Assessment Tool [GTCAT] questionnaire, a validated instrument designed to evaluate adherence-related behaviours. Intervention and Cost-Effectiveness Assessment A comparative cost-effectiveness evaluation was performed between conventional antiglaucoma eye drops and preservative-free formulations. Direct drug costs, treatment frequency, and patient-reported outcomes were analysed to determine the incremental cost- effectiveness ratio.

Quality-of-Life Assessment

The 25-item Visual Function Questionnaire [VFQ-25] was administered to assess the vision-related

quality of life of glaucoma patients. The questionnaire evaluates multiple functional domains, including general vision, near and distance activities, social functioning, mental health, and dependency.

RESULTS AND DISCUSSION

Table 1: Gender Wise Distribution

Gender	Number of patients	%
Male	208	52
Female	192	48
Total	400	100

Table 1 shows that males were greatly affected due to glaucoma. Out of 400 patients about 52% of males and 48% of females were affected.

Table-2: Age Wise Distribution

Age group	Number of patients	%
50-59	72	18
60-69	156	39
70-79	148	37
80-89	24	6
Total	400	100

Table 2 depicts that out of total patients [N=400], the more prominent age group affected by glaucoma was between 60-69 years which constitutes 39%, followed by age group between 70-79 years constituting about 37%.

Table-3: Prevalence of Ocular Surface Disease in Glaucoma Patients

OSD	Prevalence of OSD in glaucoma patients	
	Number of patients	%
Allergic conjunctivitis	88	22
Blepharitis	56	14
Dry eyes	184	46
Thickened Eyelid	12	3
Nil	60	15
Total	400	100

Table 3 states the pre-existing ocular surface diseases. Dry eyes were the mostly occurred ocular surface disease in 46%, followed by allergic conjunctivitis in 22 % and least occurrence was of thickened eyelid in 3% patients. Our study was similar to the study conducted by Portela RC et.al.2018 stating that keratitis and conjunctival hyperaemia were worse in glaucoma group and the overall prevalence of OSD was 71%, compared to 29% in the cataract group.

Assessment of Patient Knowledge and Therapeutic Adherence in Glaucoma Care

A total of 400 glaucoma patients were assessed using the Glaucoma Treatment Compliance Assessment Tool [GTCAT]. The results across its major domains are summarized below.

Barriers

Forgetfulness was the most commonly reported barrier, with 75% of respondents indicating difficulty remembering to instill their drops. Cost was also a significant barrier, as 65% disagreed that eye drops were reasonably priced. Availability of drops [62%] and being out of medication [56%] were additional concerns. Pain was reported by fewer patients [39%], indicating that discomfort was a less prominent barrier.

Benefits

Most participants recognized the therapeutic benefits of glaucoma treatment. A strong majority agreed that vision loss can be prevented [89%] and that eye drops control disease progression [80%]. Nearly all participants [98%] rejected the idea that untreated glaucoma would not cause blindness, reflecting good understanding of treatment importance.

Cues to Action

Negative responses were predominant in this domain. Most patients did not rely on reminders or external encouragement to use their medication, indicating limited use of cues-to-action strategies.

Knowledge

Knowledge about glaucoma was generally poor. High proportions of patients selected “don’t know” for statements regarding symptoms, risk factors, genetics, and disease mechanisms. Shows insufficient disease awareness of patients.

Patient–Physician Relationship

This domain showed excellent outcomes. Over 90% of participants agreed with their physician’s diagnosis and expressed satisfaction with the care provided.

Self-Efficacy

Most patients expressed confidence in their ability to manage their condition, with more than 60% agreeing. However, 61% indicated difficulty placing eye

drops correctly, and 76% confirmed difficulty instilling drops, highlighting technique-related challenges.

Self-Reported Adherence

Self-reported adherence was low. Only 11% indicated that they had not missed any doses in the past month, suggesting significant nonadherence despite perceived self-efficacy.

Severity

Approximately half of the patients acknowledged the seriousness of glaucoma. Over 60% disagreed with negative severity statements, indicating awareness of the potential impact on vision and quality of life.

Susceptibility

More than half of the patients acknowledged the risk of blindness if drops were not used regularly, and many were not surprised by their diagnosis. However, more than 50% also expressed concern about developing additional blinding conditions, indicating heightened perceived susceptibility.

Impact of Disease Awareness and Medication Compliance on Vision-Related Quality of Life in Glaucoma [VFQ-25]

The quality of life of glaucoma patients was assessed at baseline, immediately after patient education, and during subsequent follow-ups [Review 1 and Review 2] using the VFQ-25 questionnaire.

General Health

Patients who rated their general health as Excellent, Very Good, or Good increased progressively from baseline to Review 1 and Review 2, indicating a positive overall improvement in perceived health status following treatment and monitoring.

Worries and Pain

Responses categorized as None of the time/None, A little of the time/Mild, or Some of the time/Moderate showed a notable increase from baseline to subsequent reviews. This demonstrates a reduction in worry and pain, reflecting improved comfort and emotional well-being as therapy progressed.

Difficulty in Activities

The number of patients reporting “No difficulty at all” in performing daily activities—such as reading, noticing objects, performing routine tasks, and outdoor visits—increased from baseline to Review 1 and Review 2. This indicates a clear improvement in functional vision and activity performance.

No meaningful trend was observed in driving-related questions. This is likely because driving is not a universally applicable activity in the study sample,

especially given that 48% of participants were women, many of whom may not drive.

Vision Problems

Positive responses—classified as Definitely False and Mostly False to statements indicating visual problems—also increased across the follow-up visits. This reflects a reduction in vision-related difficulties and

improvement in patients' subjective visual function. Overall, the VFQ-25 analysis demonstrates significant improvements across general health, emotional well-being, activity performance, and vision-related symptoms between baseline and follow-up visits. These findings suggest that ongoing treatment and counselling contributed positively to the quality of life of glaucoma patients.

Table-4: Eye Conditions of Patients During R1 & R2 of Both Groups

Eye conditions	Baseline				Review 1				Review 2			
	Group	%	Group	%	Group	%	Group	%	Group	%	Group	%
	1		2		1		2		1		2	
Blurred vision	168	84	140	70	56	28	132	66	28	14	112	56
Redness of eye	136	68	128	64	104	52	112	56	32	16	88	44
Itching	88	44	100	50	72	36	108	54	44	22	120	60
Watering of eye	84	42	84	42	44	22	92	46	8	4	76	38
Foreign body sensation	96	48	48	24	64	32	64	32	20	10	56	28

Table-4 shows the eye conditions the patient had from the time of admission to the second review. The blurred vision at baseline was 84% and the same was

14% at R2 among the group-1. But at the same time 70% was slightly decrease as 56% among the group-2 at Review-2.

Table-5: Distribution of Drugs Prescribed in Group 1

Durg prescribed	Frequency	
	GROUP 1	GROUP 2
Bimatoprost 0.03%	56	36
Timolol 0.5%	20	24
Latanoprost	80	32
Latanoprost, Timolol 0.1%	24	44
Bimatoprost, Timolol	8	40
Bimatoprost+timolol 0.1%	12	24

Tables 5 summarize the drug prescriptions for Group 1 and Group 2 patients, respectively. Group 1 received six medications, all as single-drug therapies, with g. Latanoprost being the most commonly prescribed [40%], followed by g. Bimatoprost 0.03% [28%]; only 6% of patients received a combination of Bimatoprost and Timolol. In contrast, Group 2 patients were prescribed a broader range of therapies, including four

single drugs and six combination medications. The most frequently used drug in this group was g. Brimonidine + Timolol [22%], followed by g. Bimatoprost 0.03% [18%]. Overall, Group 2 patients were managed with more diverse and combination therapies, whereas Group 1 largely received single-drug regimens, with Latanoprost as the preferred first-line agent.

Table-6: Comparison of Dose Frequency Between the Two Groups

Sl No	Dose frequency	Duration	Group-1		Group-2	
			Frequency	%	Frequency	%
1	1 drop/d	1 month	200	100	64	32
2	2 drop/d	1 month	0	0	136	68
Total			50	100	200	100

Table 6 shows the dose frequencies of group -1 was cent percent in 1 drop/d which is more convenient

while it was 0% in 2 drop/d. In respective group-2, the 2 drop/d was 68% while 1 drop/d was 32%.

Table-7: Comparison of Drug Cost Between Two Groups

Drug	Group-1		Group-2		Difference b/w means	“t”	df	Significance
	Mean	SD	Mean	SD				
	1,037	378.9	521.88	255.7	515.12	7.97	85	P<0.0001

Table 7 compares the drug cost of both groups. The mean cost of group-1 was Rs.1037± 378.9 and group

2 was Rs.521.8 ±255.7. The differences of both groups were statistically significant [P<0.0001].

Table-8: ADR Present During R1 & R2 Of Both Groups

ADR	Review 1				Review-2			
	Group 1	%	Group 2	%	Group 1	%	Group	%
Dry eye	104	52	152	76	32	16	176	88
Allergic conjunctivitis	44	22	60	30	20	10	144	72
Conjunctival hypermia	28	14	16	8	28	14	88	44
Blepharitis	52	26	56	28	16	8	140	70
Lid edema	24	12	12	6	12	6	52	26
P value	P Value		> 0.7694		P value		< 0.0012	

Table 8 shows the ADRs at review R1 and R2. Five types ADRs were noted. Among them dry eyes were the most commonly occurred ADR in both groups at review 1 and 2. difference in baseline visit and review 2 shows marked reduction shown in group 1 unlike group 2.

CONCLUSION

Glaucoma can lead to severe, irreversible visual impairment if undetected or untreated, with intraocular pressure [IOP] reduction remaining the cornerstone of pharmacological management. In this study of 400 patients, males [n=208] and individuals aged 60–79 years were the most affected. Ocular surface disease [OSD], particularly dry eyes [n=184], was highly prevalent among patients on glaucoma therapy. Patient education significantly improved disease knowledge, medication adherence, and quality of life, with notable improvements in general health and vision, and modest improvements in activity performance and vision-related problems. The GTCAT questionnaire revealed high barriers, limited knowledge, and low self-reported adherence in the study population. Adverse drug reactions [ADRs], primarily dry eyes, were reported, with preservative-free [PF] drops showing fewer ADRs

compared to preserved [P] drops. While PF drops are more expensive, their reduced ocular toxicity and effectiveness in lowering IOP make them a cost-effective option. Conventional preserved drops may induce reversible ocular irritation, whereas PF drops minimize symptoms and signs of ocular surface disease. Risk factors for OSD include long treatment duration, age, sex, comorbidities, environment, and ethnicity. Overall, individualized treatment considering efficacy, safety, cost, and patient education is essential to optimize outcomes and quality of life in glaucoma patients.

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