

Patients' Satisfaction with Topical Anti-Glaucoma Medications and Associated Factors at Gondar University Tertiary Eye Care and Training Center, Northwest Ethiopia, 2021

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Background: Glaucoma is one of the leading cause of global irreversible blindness if left untreated. Satisfaction is a multifaceted outcome based on sufficient information and encouragement from the practitioner and based on the medications' nature. Determining patients' satisfaction is essential to increase their courage in their long-time follow-up of medical care.

Objective: To assess Patients' satisfaction with topical anti-glaucoma medications and associated factors among glaucoma patients at Gondar University Tertiary Eye Care and Training Center, Northwest Ethiopia.

Methods: Hospital-based cross-sectional study was conducted from June 30 to August 27, 2021, among 395 glaucoma patients at Gondar University Tertiary Eye Care and Training Center. Data was entered into Epi info version 7 and exported to SPSS version 26 software for analysis. A Binary logistic regression model was used to determine factors associated with satisfaction with topical anti-glaucoma medications. Statistical significance was considered when p-value < 0.05.

Results: A total of 395 study subjects participated in the study with a response rate of 93.38%. The overall satisfaction with topical anti-glaucoma medication was 62.5% with 95% CI: (57.5–67.8%). The absence of ocular side effects (AOR=5.39, 95% CI: 2.35–12.37) and the absence of ocular surface diseases (AOR=4.12, 95% CI: 1.69–10.09) were significantly associated with patient satisfaction.

Conclusion: More than half of the study participants were satisfied with topical anti-glaucoma medications. The absence of ocular side effects and absence of Ocular surface diseases were significantly associated with patient satisfaction with anti-glaucoma medication.

Keywords: satisfaction, anti-glaucoma medication, Gondar, Northwest Ethiopia

Introduction

Glaucoma is one of the leading cause of global irreversible blindness. It affects 60.5 million people globally and this number is estimated to be 111.8 million by 2040.^{1–3} The prevalence of primary open-angle glaucoma (POAG) is highest in Africa (4.20%) and that of Primary angle-closure glaucoma (PACG) is highest in Asia (1.09%).³ Glaucomatous damage to the optic nerve can be prevented by effective lowering of intraocular pressure (IOP). This can be true through good patients' compliance with treatment and regular clinical follow-ups which in turn increases patients' satisfaction.^{4–8}

Patient Satisfaction is a multifaceted outcome based on sufficient information and encouragement from the practitioner and based on the medications' nature of convenience, acceptability, ease of use, efficacy, and side effect profile.^{5,9} Satisfaction with topical anti-glaucoma medication is the patient's evaluation of the process of taking the medication and the outcomes associated with it.¹⁰ The impact and tolerability of treatment are significant considerations to measure satisfaction. Patients who are satisfied with treatment are more likely to continue using medical services, cooperate with healthcare providers by disclosing important medical information, and comply with treatment.⁹ Various manifestations of

ocular surface disease (OSD) such as blepharitis, meibomian gland dysfunction, dry eye, eczema, rosacea, allergic conjunctivitis, and hyperemia are the most common adverse events of topical anti-glaucoma medications and challenging patients' satisfaction.^{5,7,11} Satisfaction with medication is important since glaucoma is chronic, asymptomatic, and can lead to irreversible vision loss and predicts patients' continuation of pharmaceutical treatment, correct medication usage, and compliance with medication regimens.¹¹ Within the past few years, patient satisfaction with medical care showed increasing interest globally. This interest reflects the perspective that has developed over this time of the patient as an active consumer of health care services rather than merely as a passive recipient of these services.¹⁰

Patients satisfied with anti-glaucoma medications are more likely to comply with medical treatments and their follow-up appointment time because glaucoma needs strict follow-up in the patient's lifetime. But, in Africa including Ethiopia and the study area, there are limited studies and little is known about patient satisfaction with anti-glaucoma medications.

Therefore, this study aimed to assess patients' satisfaction with topical anti-glaucoma medications and associated factors among glaucoma patients at Gondar University tertiary eye care and training center, Northwest Ethiopia.

Methods

Study Design, Period, and Setting

A Hospital-based cross-sectional study was conducted from June 30 to August 27, 2021, at Gondar university comprehensive and specialized hospital tertiary eye care and training center (UGCSHTECTC), Gondar, Northwest Ethiopia. Gondar city is the capital of the central Gondar administrative zone and it is located 738 km away from Addis Ababa, the capital city of Ethiopia, and 180 km from Bahir-Dar, the administrative capital city of Amhara National Regional State.

The tertiary eye care and training center is the only eye care center in Gondar city and was established in 2004 by Orbis international and light for the world in collaboration with the department of ophthalmology and optometry. It provides eye care services for a large number of people in Northwest Ethiopia. Glaucoma clinic is one of the different service provision areas in this tertiary eye care and training center and it is open for patients three days a week (Monday, Wednesday, and Friday). Based on daily logbook registration, 26 to 70 patients get services per day in the glaucoma clinic.

Source and Study Population

The source population was all adult glaucomatous patients with anti-glaucoma medications attending UGCSHTECTC and the Study population was all adult glaucomatous patients with anti-glaucoma medications attending UGCSHTECTC during the data collection period.

Inclusion and Exclusion Criteria

All adult glaucomatous patients with anti-glaucoma medication follow-up in the outpatient department for at least six months⁴ before the data collection time were included in the study. Patients who were unable to communicate due to mental illness were excluded from the study.

Sample Size and Sampling Procedures

Since there was no previous study done on patient satisfaction with topical anti-glaucoma medications and associated factors in Ethiopia including in the study area, the sample size was calculated by assuming 50% of the proportion of the study participants had satisfaction with topical anti-glaucoma medications. With a precision of 5%, at a 95% confidence level and an additional 10% to compensate for nonresponse rate, the calculated sample size was 423 by using the single population proportion formula.

$$n = \frac{(Z\alpha/2)^2 p(1 - p)}{d^2}$$

Where; n = sample size

Z = Value of z statistic at 95% confidence interval = 1.96

P – Proportion satisfied patients with topical anti-glaucoma medications (50%)

d – Marginal error 5% = 0.05.

$$\text{Sample size}(n) = \left(\frac{(1.96)^2 \cdot 0.5(1 - 0.5)}{(0.05)^2} \right) = 384$$

The calculated sample size became 384 and by considering a 10% non-response rate, the final sample size was 423.

A systematic random sampling method was used to select the required samples. According to glaucoma patients' logbook registration in UGCSHTECTC, the number of patients attending the glaucoma clinic per day was about 48 on average. This implies that the total number of patients attending the glaucoma clinic during the data collection period was estimated as 1248. The "K" value (interval between each study participant) for this study was 3 (ie, 1248 divided by total sample size, of 423). The first eligible study subject was selected by using a lottery method then every "K" (every 3) participant was interviewed to get the required data set.

Operational Definition

Satisfaction: Participants scoring greater than or equal to the median (32.00) of the sum of all the eight satisfaction questions were categorized as satisfied whereas, participants scoring below the median were categorized as unsatisfied.¹²

Knowledge: Participants who scored the median (11.00) and above of the eleven knowledge questions were considered to have good knowledge while those who scored below the median were considered as having poor knowledge.^{13,14}

Data Collection Procedures and Quality Control

A semi-structured and interviewer-administered questionnaire developed from different reviewed literatures^{9,15-17} was used in data collection. The questionnaire was prepared in English language and then translated to the local (Amharic) language. A pretest was done on 5% of study samples (22 patients) at Felege-Hiwot Comprehensive Specialized Hospital Eye Care Center in Bahir Dar and Cronbach's alpha ($\alpha=0.89$) was used to check for its internal consistency in all eight patient satisfaction questions. Data were collected by two optometrists after one day of training was given by the principal investigator on the objective of the study, on how to obtain consent, and on how to record. The questionnaire contains the main socio-demographic characteristics of the study participants, satisfaction questions, and clinical characteristics. All satisfaction questions consisted of a 5-level Likert scale ranging from Very unsatisfied (1 point) to Very satisfied (5 points) and from Very difficult (1 point) to Very easy (5 points). Clinical questions were reviewed from medical registration charts after they finish their examination in the glaucoma clinic.

Data Processing and Analysis

The collected data were entered into Epi info version 7 and exported to SPSS version 26 software for analysis. The data were made ready for analysis after cleaning and coding into categories. Descriptive statistics of the main socio-demographic and clinical characteristics of the study participants were presented in tables and overall patients' satisfaction with topical anti-glaucoma medications was presented in a pie chart. Candidate variables for multivariable analysis were selected with a 0.2 level of significance by using bivariable logistic regression. Model fitness was checked by the Hosmer and Lemeshow Test (0.201). A multivariable logistic regression model was used to determine factors associated with patient satisfaction with topical anti-glaucoma medications. Variables (factors) having a p-value less than 0.05 with a 95% confidence interval in multivariable logistic regression were considered as significantly associated with the dependent variable and AOR was used to measure the strength of association between predictor variables and the outcome variable.

Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki and approved by the ethical review committee of the University of Gondar, college of medicine and health science, school of medicine. Permission was also obtained from the ophthalmology department at University of Gondar. Study participants were informed by the data collectors about the objective of the study and they were able to know that there is no harm to them in participating in the study except devoting some time for an interview. Written informed consent was obtained from each participant. Confidentiality was kept secure by avoiding personal identifiers in the data collection tool.

Result

Socio-Demographic Characteristics

A total of 395 study subjects participated in the study with a response rate of 93.38%. The median age of participants was 63 years with an interquartile range (IQR; 54–70). The majority of (66.6%) the participants were males, (Table 1).

Clinical Characteristics and Knowledge of the Study Participants

The study participants' median time since diagnosis of glaucoma in either eye was 3 years with IQR: 1.50–5.33. The majority (40.8%) of the study participants' follow-up time was every two months and about 13.9% of the study participants missed their appointment time at least once in their glaucoma follow-up time in the last year. Twenty-seven (6.8%) participants had ocular surface diseases in either eye of which more than half, (59.25%) of them were with blepharitis. The majority, 253 (64.1%) of the study participants had good knowledge about glaucoma. Almost all study participants, (99.7%) were using timolol. About 8.90% of the participants reported using eye drops other than anti-glaucoma medications (Table 2).

Patients' Satisfaction with Topical Anti-Glaucoma Medications

The overall patients' satisfaction with topical anti-glaucoma medication was 62.5% with a 95% CI: (57.5–67.8%).

Table 1 Socio-Demographic Characteristics of the Study Participants at Gondar University Tertiary Eye Care and Training Center, Northwest Ethiopia, 2021 (n=395)

Variables		Frequency	Percentage (%)
Age (years)	22–54	100	25.3
	55–63	99	25.1
	64–70	98	24.8
	71–88	98	24.8
Sex	Male	263	66.6
	Female	132	33.4
Education level	Cannot write and read	197	49.9
	Can write and read	85	21.5
	Primary	44	11.1
	Secondary	35	8.9
Residence	College/university	34	8.6
	Rural	241	61.0
Religion	Urban	154	39.0
	Orthodox	324	82.0
Occupation	Muslim	60	15.2
	Farmer	169	42.8
	Protestant	11	2.8
	Government employ	36	9.2
Marital status	Private work	38	9.6
	Housewife	93	23.5
	Retire	40	10.1
	Others*	19	4.8
	Married	341	86.3
	Single	16	4.1
	Divorced	14	3.5
	Widowed	24	6.1

Note: Others* (students, NGO employee, non-employed).

Table 2 Medication, Follow-Up, and Clinical Characteristics of the Study Participants at Gondar University Tertiary Eye Care and Training Center, Northwest Ethiopia, 2021 (n=395)

Variables		Frequency	Percentage (%)
VA	Normal ($\geq 6/12$)	98	24.8
	Mild (worse than 6/12)	44	11.2
	Moderate (worse than 6/18)	200	50.6
	Severe (worse than 6/60)	38	9.6
	Blindness (worse than 3/60)	15	3.8
Type of glaucoma	POAG	187	47.4
	PACG	19	4.8
	Secondary Glaucoma	189	47.8
Severity of glaucoma	Early	62	15.7
	Moderate	98	24.8
	Severe	235	59.5
CDR	≤ 0.65	49	12.4
	0.7–0.85	153	38.7
	≥ 0.9	193	48.9
Follow up time	Monthly	107	27.1
	Every 2 months	161	40.8
	> 3 months	127	32.2
Missed follow up	No	340	86.1
	Yes	55	13.9
Ocular surface disease	Yes	27	6.8
	No	368	93.2
Type of glaucoma medication	Beta-blocker (Timolol)	394	99.7
	Miotics	9	2.3
	Prostaglandin analog	1	0.3
Other topical medication	Yes	35	8.9
	No	360	91.1
Knowledge about glaucoma	Poor	142	35.9
	Good	253	64.1

Factors Associated with Topical Anti-Glaucoma Medication Satisfaction

Binary logistic regression model was used to identify factors associated with patients' satisfaction with topical anti-glaucoma medications. Variables like patients' age, marital status, type of glaucoma, the severity of glaucoma, ocular surface diseases, and frequency and side effects of topical anti-glaucoma medications were selected for multivariable analysis based on a 0.2 level of significance. Finally, the factors listed in the table below were used to compute the adjusted odds ratio (AOR) in multivariable logistic regression analysis. The absence of ocular side effects of topical anti-glaucoma medications upon instillation and ocular surface diseases (OSD) were found to be statistically significantly associated with patients' topical anti-glaucoma medication satisfaction at $p < 0.05$ level of significance with 95% CI. The odds of satisfaction with topical anti-glaucoma medications were 5.39 times higher among patients without ocular side effects than patients who had side effects (AOR=5.39, 95% CI: 2.35–12.37). The odds of satisfaction with topical anti-glaucoma medications were 4.12 times higher among patients without OSD than patients who had OSD (AOR=4.12, 95% CI: 1.69–10.09) (Table 3).

Discussion

This institution-based cross-sectional study was conducted to assess satisfaction with topical anti-glaucoma medications and associated factors among glaucoma patients at GUCSHTECTC glaucoma clinic, Gondar Northwest Ethiopia.

This study showed that the overall patients' satisfaction with topical anti-glaucoma medications was 62.5%. The absence of ocular side effects of topical anti-glaucoma medications and OSD were found to be statistically significantly associated with patients' overall satisfaction with topical anti-glaucoma medications.

Table 3 Factors Associated with Patient Satisfaction with Topical Anti-Glaucoma Medications at Gondar University Tertiary Eye Care and Training Center, Northwest Ethiopia, 2021 (n=395)

Variables	Satisfied n (%)	Unsatisfied n (%)	COR (95% CI)	AOR (95% CI)	p-value
Age (yrs.)					
22–54	61 (61)	39 (39)	1.00	1.00	
55–63	58 (58.6)	41 (41.4)	0.90 (0.51–1.60)	0.88 (0.46–1.68)	0.693
64–70	69 (70.4)	29 (29.6)	1.52 (0.84–2.75)	1.36 (0.68–2.71)	0.383
71–88	59 (60.2)	39 (39.8)	0.97 (0.55–1.71)	0.67 (0.33–1.37)	0.277
Marital status					
Married	215 (63)	126 (37)	1.00	1.00	
Single	7 (43.8)	9 (56.2)	0.46 (0.17–1.25)	0.54 (0.17–1.71)	0.292
Divorced	8 (57)	6 (43)	0.78 (0.27–2.30)	0.74 (0.24–2.32)	0.605
Widowed	17 (70.8)	7 (29.2)	1.42 (0.57–3.53)	1.93 (0.70–5.33)	0.204
Medication frequency					
Once to BID	238 (63.6)	136 (36.4)	1.00	1.00	
TID or more	9 (42.9)	12 (57.1)	0.43 (0.18–1.04)	0.39 (0.13–1.20)	0.101
Side effect					
Yes	9 (25.0)	27 (75.0)	1.00	1.00	
No	238 (66.3)	121 (33.7)	5.90 (2.70–12.94)	5.39 (2.35–12.37)	<0.001
OSD					
Yes	8 (29.6)	19 (70.4)	1.00	1.00	
No	239 (65.0)	129 (35.0)	4.40 (1.87–10.33)	4.12 (1.69–10.09)	0.002
Glaucoma type					
POAG	124 (66.3)	63 (33.7)	1.00	1.00	
PACG	12 (63.2)	7 (36.8)	0.87 (0.33–2.32)	1.08 (0.31–3.73)	0.909
Secondary glaucoma	111 (58.7)	78 (41.3)	0.72 (0.48–1.10)	0.65 (0.40–1.05)	0.078
Glaucoma severity					
Early	42 (67.7)	20 (32.3)	1.00	1.00	
Moderate	54 (55.1)	44 (44.9)	0.58 (0.30–1.14)	0.68 (0.33–1.40)	0.292
Severe	151 (64.3)	84 (35.7)	0.86 (0.47–1.55)	1.01 (0.51–2.03)	0.973

The overall patient satisfaction of this study was in line with the study done in Korea (67.0%).¹⁸ This might be due to the similarities in the study setting and design since both studies were hospital-based cross-sectional studies.

The proportion of patient satisfaction in this study was higher than in other study done in Vietnam (49.2%)¹⁹ but lower than in studies done in the United States of America (77.9%),²⁰ Birmingham (100%),²¹ and the United Kingdom (90.4%).²² The difference in the socio-demographic and /or economic status of the study participants, and differences in health systems and medication accessibility may bring such discrepancies between the results of this study.

In the present study, among variables analyzed in multivariable regression, only two variables were statistically significantly associated with patient satisfaction with topical anti-glaucoma medications.

Participants who did not have ocular side effects upon the instillation of topical anti-glaucoma patients are more likely to be satisfied than those who had ocular side effects. This result is in agreement with other studies done in the USA¹⁵ and Europe.^{5,7,9} This might be due to that side effects upon instillation of topical anti-glaucoma medications may overweigh in some individuals by inducing discomfort and inconvenience. Repeated allergies represent a load to patients and are a factor discouraging compliance and satisfaction.¹² These may increase the proportion of patients declaring being dissatisfied with their current glaucoma treatment.²¹ As a result, patients without ocular side effects upon instillation may show more satisfaction than patients who had side effects.

Participants without ocular surface disease are more likely to be satisfied with topical anti-glaucoma medications than those who have ocular surface disease. This finding is consistent with other studies.^{5,23,24} This could be resulted from preservatives in topical anti-glaucoma medication trigger OSD and impact treatment compliance and satisfaction.²⁴ Ocular surface diseases are common among glaucoma patients receiving topical anti-glaucoma medications. The severity

increases in older patients and those receiving multiple treatments. Besides the presence of OSD, glaucomatous patients need to take multiple treatments on top of anti-glaucoma medications.²⁵ Moreover, the severity of OSD has been associated with low effective control of IOP.^{23,24}

Limitation of the Study

The study was not able to explore the effects of different classes of medications on patients' satisfaction because medications other than timolol were often used by only a small number of patients, making it difficult to show differences in satisfaction between drugs. Only small domains of patient satisfaction questions were used in this study. Recall bias was observed among study participants in answering some study questions.

In addition, this study has selection bias since it is a hospital-based study participants who came for their regular follow-up were included making those who cannot come because of different reasons less represented. A follow-up study could reveal long-term ocular and systemic side effects as well as some rare side effects of topical anti-glaucoma medications which were not accomplished with this study design.

Conclusion and Recommendation

Though more than half of the study participants were satisfied with topical anti-glaucoma medications in this study, a non-negligible number of individuals were dissatisfied with anti-glaucoma medications. The absence of ocular side effects of topical anti-glaucoma medications and the absence of OSDs were areas identified to be significantly associated with patients' satisfaction with topical anti-glaucoma medications. Efforts to improve patient satisfaction should focus on ocular side effects and OSD. It is better to increase the availability of different classes of anti-glaucoma medications with preservative-free types since almost all patients reported using only preserved timolol eye drops in GUCSHTECTC.

Disclosure

The authors report no conflicts of interest in this work.

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