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Barriers to Uptake of Cataract Surgery in Southern Ethiopia

For the partial fulfillment of Specialty Certificate in Ophthalmology

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ABSTRACT

Background: Cataract is the leading cause of avoidable blindness globally and in Africa. However, various factors limit access of cataract blind individuals to cataract surgery. This study aims to investigate the factors contributing to delayed utilization of cataract services among patients attending a free surgical eye camp in Wolaita, Southern Ethiopia.

Methods: A descriptive cross-sectional study was conducted at an outreach eye camp at Wolaita Sodo organized by HCP cure blindness from June 12 to June 17, 2023. Patients were interviewed using structured questionnaire to determine the reasons for delay in uptake of cataract surgeries. Analysis was conducted using SPSS version 26, and descriptive methods were employed in the analytical process.

Results: A total of 160 study participants with operable age related cataract were recruited in the study with a mean age of 61.8 years ($SD = 12.9$), with a range of 40 - 90 years. Over 79% of the respondents were above 50 years of age, The male to female ratio was 1:0.86 and 19.4% of the subjects were blind bilaterally (best corrected visual acuity $<3/60$ in the better eye). Only 30% had attained primary education or higher, while the majority, accounting for 63.1%, were illiterate. 82.5% of the interviewed participants were enrolled in a community-based health insurance scheme.

The most reported barriers for delaying surgery included: insufficient family income (43.8%), Worry about cost of surgery (25.6%), fear of undergoing surgery (15.0%), Knowing someone with unsuccessful surgery (14.4%), Cataract was not mature (13.1%).

Conclusion: Inadequate family income, surgical cost, fear about the surgical procedure, and concerns about the possibility of an unsuccessful outcome are major factors delaying cataract surgery. To address these challenges, it is crucial to provide subsidies for surgical services and enhance both the quantity and quality of cataract outreach programs.

1. Introduction

1.1. Background

Cataracts are the major cause of blindness among adults affecting 65.2 million worldwide. The World Health Organization (WHO) states that at least 2.2 billion people globally have a vision impairment or blindness, with at least 1.1 billion people with vision impairment that could have been prevented or has yet to be addressed. (1) The 2005-06 Ethiopia National Survey on Blindness, Low Vision and Trachoma Studies reported a national prevalence of blindness at 1.6% and 3.7% of the population with low vision. Based on the projected estimates of the Ethiopia National Blindness Survey, 49.9% of the 1.6 million currently blind in Ethiopia are due to cataracts alone.(2) Cataract surgery is known to be a safe and cost-effective management option to address cataract blindness.(3,4) The World Health Organization (WHO) proposed a cataract surgical rate (CSR) of 2000 operations/million persons annually as a target for cataract surgery rates in Sub-Saharan Africa (SSA) to effectively impact the burden of blindness related to cataracts in this area.(5)

Surgery stands as the sole option for restoring vision impaired by cataracts, and cataract surgery stands out as one of the most economically efficient procedures in the field of medicine. Nevertheless, several factors hinder cataract-blind individuals from reaching cataract surgery. Notably, among the barriers that significantly impede global access to cataract surgery are the absence of nearby service providers, inadequate awareness about cataracts and their treatment, doubts about the quality of locally accessible services, transportation challenges, and apprehensions regarding the financial burden of the surgical procedure. (6)

In developing nations, challenges in accessing ophthalmic care, stemming from both individual and environmental factors, as well as inherent impediments within the healthcare infrastructure, hinder the comprehensive utilization of surgical services.(7)

Various studies conducted in developing countries, notably Africa, identifying multifaceted barriers to cataract surgery utilization. These barriers include cost, lack of knowledge, logistical constraints, time constraints, fear, lack of escorts, gender-related issues, perceptions of being a burden, knowledge of unsuccessful surgeries, no perceived need, and recall failures. Attitudinal barriers, often prevailing over accessibility or cost-related concerns, have been noted in several regions, such as India. Geographic factors, like distance to healthcare facilities, are mentioned in Brazil and Sri Lanka, while China's study highlights knowledge gaps and concerns about local

service quality as principal barriers. Ethiopian studies emphasize the impact of indirect expenses, family income, unaffected eyesight, and hospital distance on surgery delays, and the importance of gender-sensitive service promotion in increasing female uptake. These findings collectively underline the diverse challenges impeding access to cataract surgery in low-resource settings.

These barriers can have a significant impact on individuals' ability to access this necessary healthcare service, leading to increased vision impairment and diminished quality of life. Therefore, it is important to understand and address these barriers to ensure equitable access to cataract surgery for all individuals in need.

The approach to mitigating the cataract backlog includes increasing in the volume of cataract surgeries performed. However, notwithstanding a relatively rapid expansion in the availability of high-quality services, surgical feasibility remains limited within certain segments of Ethiopian society.(8–10) Cataract campaigns have been developed as a solution to increasing yearly CSR in lower and middle-income countries.(11, 12) The uses of outreach eye camps have been advocated as one of the strategies to overcome some of the barriers associated with the use of eye care services.

During free outreach eye camp programs in the country, numerous individuals with cataract usually turn up. This prompted the need for this study to find out why they had not undergone the surgery before then.

The primary objective of this study is to investigate the factors contributing to delayed utilization of cataract services among patients attending a free surgical eye camp in southern Ethiopia. This research aims to achieve this objective through the comprehensive analysis of beneficiary demographics, the identification of barriers linked to patient attitudes, and the assessment of impediments concerning service delivery, cost, and affordability.

2. Subjects and Methods

2.1. Study Design

A descriptive cross sectional study was carried out among candidates who were found to have cataract blindness during an eye camp.

2.2. Study area and period

The study was conducted at an outreach eye camp at Wolaita Sodo organized by HCP cure blindness from June 12 to June 17, 2023.

2.3 Source Population

All adult patients attending a cataract surgical campaign and diagnosed to have cataract

2.4 Study Population

All adult patients who meets the inclusion criteria and consent to the study

2.5 Sample Size and sampling technique

Using the sample size formula for a single proportion:

$$n = (z^2 * p * (1 - p)) / d^2$$

Where:

n = sample size

z = the z-score (e.g., 1.96 for a 95% confidence level)

p = the estimated proportion of the population with the characteristic of interest

d = the margin of error (expressed as a decimal)

By taking 5% margin of error, 95% confidence level, and p or estimated proportion of unilateral visual Impairment due to cataract (< 6/60) in the population to be 11.1 % from a previous cross-sectional, community-based study of inhabitants over 40 years of age from villages in the Abeshge and Kebena Districts.(26)

The sample size will be 152.

All adult patients who meets the inclusion criteria and consent to the study will be included on their consecutive presentation during the study period. Convenient sampling at hospital where surgical campaign was done.

2.6 Eligibility Criteria

2.6.1 Inclusion criteria – Adult patients with visual acuity in one or both eyes < 6/60 secondary to cataract.

2.6.2 Exclusion Criteria – Adult patients with visual acuity better than 6/60 in the worse eye

Interview-assisted questionnaires were administered to those who provided to participate in the study. Individuals who either declined consent or did not fully respond to the questionnaire were

excluded from the study. Data collection occurred at the screening site before patients proceeded to the operating theater for their surgical procedure.

The diagnosis of cataract was made based on torchlight and distant direct ophthalmoscope. Vision was assessed with Snellen tumbling E chart. Patients were briefed in the local language about the purpose and procedure of the study.

Data collection comprised the gathering of socio-demographic characteristics. A verbal questionnaire, derived from existing literature, was employed to explore the barriers to access, or the causes of delayed access, to cataract surgery. The interviews were conducted within a designated, isolated space, separate from family members and other patients. The data collection process was executed by two nurses proficient in the local language through face-to-face interviews, under the supervision of the principal investigator. A daily review of the collected data ensured completeness, accuracy, and clarity, with immediate on-the-spot amendments as required. Ethical clearance was obtained from research and ethics committee of the department of ophthalmology of Addis Ababa University.

2.7. Operational Definition

Cataract: Opacity of the lens responsible for decreased vision

Blindness due to cataract: Presenting visual acuity of less than 3/60 and opacity of the lens responsible for decreased vision

Visual impairment due to cataract: Cataract causing $VA < 6/60$

Uncorrected visual acuity (UCVA): VA without corrective lenses

Urban areas are generally defined as localities with 2000 or more inhabitants and Rural areas comprise all areas not classified as urban. (Ethiopia Central Statistical Agency Household survey National Labour Force Survey (NLFS) 2005).

3. Results

In the study, a total of 160 subjects were enrolled, with a mean age of 61.8 years (SD = 12.9), spanning an age range from 40 to 90 years. Among the study participants, 127 individuals (89.4%) were aged 50 years or older. Of the total subjects, 86 (53.8%) were male, and in terms of educational status, only 30% had attained primary education or higher, while the majority, accounting for 63.1%, were illiterate (Table 1). Additionally, 52.5% of participants identified as farmers.

Upon examination at the outreach site, 103 subjects (64.4%) exhibited visual acuity of less than 3/60 in the operable eye category based on visual acuity. Moreover, 19.4% of patients experienced blindness in both eyes, characterized by vision worse than 3/60 in the better eye. In contrast, 53.7% of patients had vision better than 6/60 in their better eye. Approximately half of the study subjects reported a significant poor vision for more than 24 months.

A significant proportion (88.8%) of patients reported familiarity with family or friends who had undergone cataract surgery. Among these individuals, 48% mentioned that these acquaintances had received cataract surgery through campaigns or outreach programs.

Furthermore, 82.5% of the interviewed participants were enrolled in a community-based health insurance scheme.

Table 1. Socio-Demographic characteristics of Study Subjects

Variables		Frequency N (%)
Age	Up to 50	47(29.4)
	51 - 65	52(32.5)
	66 and above	61(38.1)
Sex	Male	86(53.8)
	Female	74(46.2)
Residence	Rural	127(79.4)
	Urban	33(20.6)
Occupation	Farmer	87(54.4)
	House wife	26(16.2)
	Daily Laborer	18(11.3)
	Merchant	18(11.3)
Educational Status	Unable to read and write	101(63.1)
	Able to read and write	11(6.9)
	Primary school	31(19.4)
	Secondary school and above	17(10.6)

In this study, participants reported various barriers contributing to the delayed uptake of cataract surgery. The most common barriers hindering timely surgical intervention were financial constraints, including insufficient income, which accounted for 43.8% of respondents, and concerns about the cost of surgery, cited by 25.6% of participants. Additionally, fear about the surgical procedure itself was reported as another common barrier by 15.0% of respondents.

Moreover, 14.4% of participants noted concerns about knowing someone who had undergone unsuccessful surgery and an additional 8.1% of respondents cited their fear of potential vision loss as a contributing factor to their hesitancy towards the surgery. Furthermore, 10.6% of participants attributed their delay in opting for cataract surgery to their perception of being advanced in age.

Furthermore, Participants cited issues such as being told that their cataract was not mature (13.1%), uncertainty about where to obtain treatment (9.4%), the unavailability of transportation (7.5%), and residing at a considerable distance from the hospital (5.0%) as factors contributing to delays in seeking cataract surgery. Gender disparities were evident, as 9.4% of women claimed that being female limited their decision to access to cataract surgery. They attributed their gender to the potential influence on their decision-making process and to the delays encountered in seeking surgical procedures.

Conversely, the barriers reported as the least prevalent included the belief that blindness is God's will (3.8%), and residing in areas not connected to the main road (2.5%). These factors were identified by a relatively small proportion of participants as reasons for delaying cataract surgery.

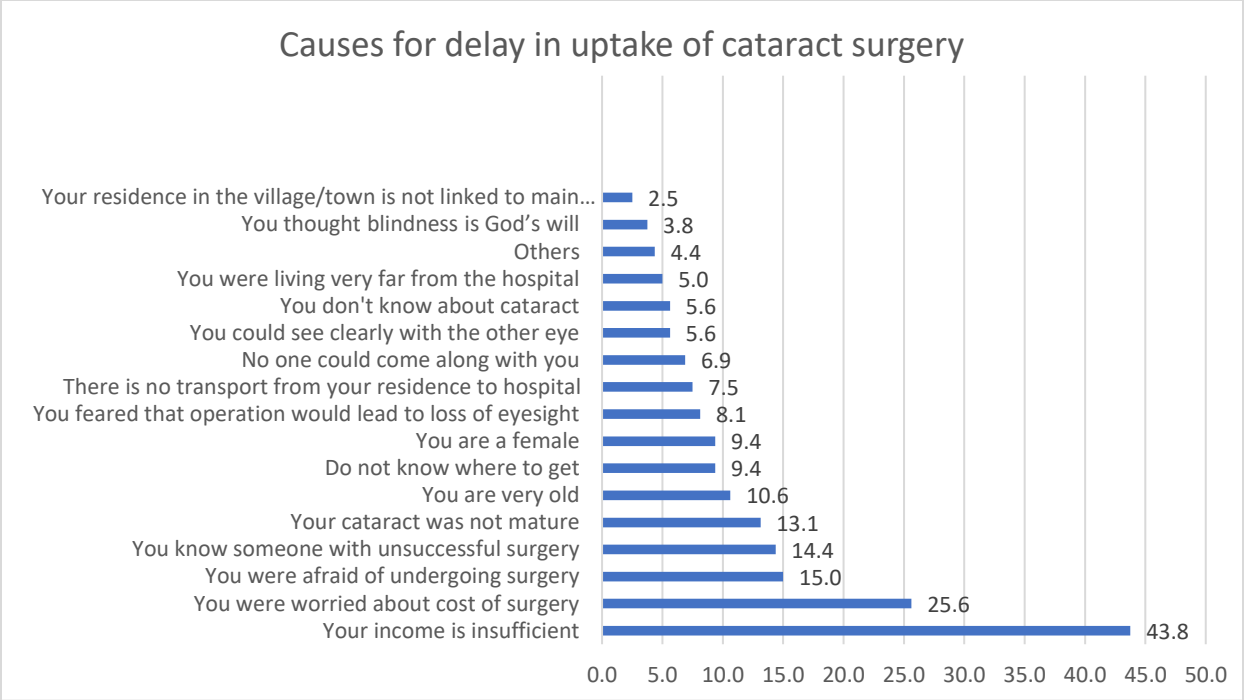


Figure 1. Causes for delay in uptake of cataract surgery

While both males and females commonly cited insufficient income and fear of surgery, higher proportion of females expressed higher concerns about the cost of surgery, a lack of transport to the hospital, and the absence of an escort. On the other hand, more males mentioned that their cataract was not yet mature as a reason for postponing surgery. However, these differences has no statistically valid differences, the confidence interval significantly overlap. Insufficient income was cited by 23.1% of male (20.5, 25.7) and 20.6% of females (18.11, 23.09). There is significant overlap in confidence interval of all other reasons identified by males and females. However, a unique gender-specific barrier for females was related to their gender itself, suggesting that some women perceived their gender and decision making in the household as a hindrance to accessing healthcare.

Table 2. Causes for delay in Uptake Cataract Surgery in Terms of Sex Category Among Study Subjects

Reasons	Male	Female	Total
Insufficient Income	37(23.1%)	33(20.6%)	70(43.8%)
Worried about cost of surgery	18(11.3%)	23(14.4%)	41(25.6%)
Afraid of undergoing surgery	12(7.5%)	12(7.5%)	24(15.0%)
Know someone with unsuccessful surgery	10(6.3%)	13(8.1%)	23(14.4%)
Cataract was not mature	14(8.8%)	7(4.4%)	21(13.1%)
Being very old	7(4.4%)	10(6.3%)	17(10.6%)
Don't know where to get the	10(6.3%)	5(3.1%)	15(9.4%)
Female Gender		15(9.4%)	15(9.4%)
Fear that operation would lead to loss of eyesight	4(2.5%)	9(5.6%)	13(8.1%)
Lack of transport to hospital	3(1.9%)	9(5.6%)	12(7.5%)
Lack of escort	7(4.4%)	4(2.5%)	11(6.9%)
Village/town is not linked to main road	2(1.3%)	2(1.3%)	10(6.3%)
Can see clearly with the other eye	7(4.4%)	2(1.3%)	9(5.6%)
Don't know about cataract	6(3.8%)	3(1.9%)	9(5.6%)
Living very far from the hospital	5(3.1%)	3(1.9%)	8(5.0%)
Others	6(3.8%)	1(0.6%)	7(4.4%)
God's will	5(3.1%)	1(0.6%)	6(3.8%)

4. Discussion

Various studies in developing countries, including Africa, have consistently highlighted key barriers to cataract surgery uptake. These barriers encompass financial, attitudinal, and gender-related factors. Cost emerged as a pervasive issue, as demonstrated by both the literature review and the current study. In our study, 'insufficient income' (43.8%) and 'worries about the cost of surgery' (25.6%) were identified as major barriers, echoing findings from multiple studies (9, 13–18). In this study, 82.5% of the interviewed participants were enrolled in a community-based health insurance scheme. Nevertheless, the participants identified financial factors as a significant barrier. This observation might be attributable to the limitations of community-based insurance, specifically its insufficient coverage of certain costs, notably medicines and surgical consumables, frequently unavailable in hospital pharmacies. Furthermore, previous research conducted by Melsew M and colleagues, along with similar studies in Mali and India, has consistently highlighted the importance of indirect expenses, such as the loss of daily income and transportation costs for both patients and their attendants. (27, 28, 29)

The study was carried out among patients who presented for cataract surgery during a free surgical outreach program, where they receive free transportation and services, effectively removing the financial barriers associated with direct and indirect costs. Within this group, financial concerns emerged as a prominent factor contributing to delay in uptake of cataract surgery. This can be attributed to the demographic composition, where the majority of participants are subsistence farmers who may not possess the financial means necessary to afford cataract services.

The study explicitly identified fear, particularly 'fear of undergoing surgery' (13.8%) and a further 8.1% of respondents cited their fear of potential vision loss as a contributing factor to their hesitancy towards the surgery as a significant barrier, in line with other studies which reported fear as a recurring theme (17, 18). This could be attributed to misconceptions surrounding cataract surgery, subpar quality of past surgical outreach within the region, or negative experiences shared by acquaintances or family members who had previously undergone cataract surgery.

In 13.1% patients delayed surgery was because their cataracts were not considered mature. This suggests a belief that the surgery should only be performed when the condition reaches a certain stage. Waiting for the cataract until it becomes mature was the most common reported barrier for

cataract surgery utilization in the study done by Bizuneh et al at two camp sites Fiche Town General Hospital, Central Ethiopia and Dubti General Hospital in Afar. (30)

In this study, a relatively smaller percentage of 5.6% represented a lack of knowledge about cataracts and available treatments as an issue, in contrast to the prominent factors of cost and fear. This differs from studies conducted in India and China, where lack of knowledge is one of the major barriers (19 – 21).

Geographic factors, such as greater distance to hospitals, or villages not linked to the main road and lack of transport from the residence to the hospital constituted lesser proportion to other barriers. This differs from earlier studies in Ethiopia. For instance, a 2011 study by Mehari et al. conducted in central Ethiopia revealed that 47.9% of participants identified the hospital being too far from their home as a major barrier, and 31.5% noted the absence of road access between their village or town and a major roadway. In another investigation conducted at two surgical camps in Fiche and Dubti, as reported by Bizuneh et al. in 2021, a substantial proportion of participants, (specifically 34%) identified the distance from eye health institutions significant barriers. (27, 30) Moreover, studies conducted in Brazil and Sri Lanka (24, 25) emphasized the impact of geographical distance on uptake of cataract surgical service. This could be ascribed to the enhanced road infrastructure and the presence of multiple secondary eye care facilities in the region. For instance, within a 200-kilometer radius of our study area, there are three secondary eye care centers, in contrast to the locations where previous studies were conducted.

Gender disparities were evident in our study as it is in many other literatures. In some cases, women were less likely to express a need for sight due to fear of being seen as a burden. Our data reflected this gender-related barrier with being 'female gender' (9.4%), albeit to a lesser extent (16, 22).

This study has certain limitations to consider. It was exclusively conducted at free outreach sites. Thus, our study only encompassed patients capable of attending the outreach program. We believe that there might be a larger population of elderly individuals with visual impairments who did not participate and thus are not represented in our study.

Conclusion:

Inadequate family income, surgical cost, fear about the surgical procedure, and concerns about the possibility of an unsuccessful outcome are major factors delaying cataract surgery. To address these challenges, it is crucial to provide subsidies for surgical services and enhance both the quantity and quality of cataract outreach programs.

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Annex

Questionnaire

Questionnaire No _____

Part 1: Socio-demographic characteristics			
Code	Questions	Options	Skip
Q 101	Sex	1. Male 2. Female	
Q102	Age	_____ years	
Q103	Residence	1. Urban 2. Rural	
Q104	Education status	1. Unable to read and write 2. Able to read and write 3. Primary school 4. Secondary school 5. College/university	
Q105	What is your occupation?	1. Student 2. Farmer 3. Daily labor 4. Merchant 5. Government employed 6. Others(specify)_____	

Part 2: Pre-operative variables			
Code	Questions	Options	Skip
Q 201	UCVA VA OD	1. $\geq 6/18$ 2. 6/18 – 6/60 3. 6/60 – 3/60 4. $< 3/60$	
Q 202	UCVA VA OS	1. $\geq 6/18$ 2. 6/18 – 6/60 3. 6/60 – 3/60 4. $< 3/60$	
Q 203	Operable eye Unaided VA	1. OD 2. OS	
Q 204	Maturity of Cataract	1. Immature 2. Mature 3. Hypermature	
Q 205	Duration of Cataract in Months	1. Up to 6 mo 2. 7 – 12 mo 3. 13 – 24 mo 4. > 24 mo	
Q 206	Which eye is selected for surgery? (Laterality)	1. Unilateral 2. Bilateral	
Part 3: Health-related variables			
Code	Questions	Options	Skip
Q 301	Do you have families/friends who had a history of cataract surgery?	1. Yes 2. No	
Q 302	From where did they get the services?	1. Government hospital 2. private hospital 3. campaign/outreach	If Yes for Q301
Q 303	Do you have a health insurance scheme (Community based health insurance?)	1. Yes 2. No	
Q 304	Barrier related to patient attitude: Did you delay the treatment because	1. You were afraid of undergoing surgery 2. You were worried about cost of surgery	Yes/No Yes/No

		<ul style="list-style-type: none"> 3. You feared that operation would lead to loss of eyesight 4. You know someone with unsuccessful surgery 5. You could see clearly with the other eye 6. Your cataract was not mature 7. You thought blindness is God's will 8. You are a female 9. You are very old 	<p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p>
Q 305	Barrier relating to service delivery, cost, and affordability: Did you delay the treatment because	<ul style="list-style-type: none"> 1. Do not know where to get 2. You were living very far from the hospital 3. Your residence in the village/town is not linked to main road 4. There is no transport from your residence to hospital 5. No one could come along with you 6. Your income is insufficient 	<p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p>