



Formative Behavioural Analysis Report

KeepSight Glaucoma Pilot Project
in FCT, Nigeria
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Abbreviations

BCW	Behaviour Change Wheel
CDDs	Community Drug Distributors
COM-B	Capability, Opportunity, Motivation and Behaviour
COVID-19	Coronavirus Disease 2019
CSR	Corporate Social Responsibility
FCT	Federal Capital Territory
FGD	Focus Group Discussion
GTCAT	Glaucoma Treatment Compliance Assessment Tool
HBM	Health Belief Model
KII	Key Informant Interview
NHIS	National Health Insurance Scheme
NGOs	Non-Governmental Organisations
PHC	Primary Healthcare Centre
SBC	Social Behaviour Change
SMS	Short Message (or Messaging) Service
UATH	University of Abuja Teaching Hospital

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Executive summary

This report covers the formative behavioural analysis carried out to provide in-depth insights from key stakeholders on the enablers and barriers to positive change in priority glaucoma behaviours. The overall aim of the analysis, commissioned by the Sightsavers KeepSight project, is to generate evidence to design intervention activities, and produce materials and messages to encourage and influence the following expected four behavioural changes:

1. Men and women over 40 who are at risk of glaucoma attend a screening centre.
2. Men and women over 40 who are at risk of glaucoma attend a hospital testing facility.
3. People with a glaucoma diagnosis attend regular follow-up appointments.
4. People with a glaucoma diagnosis adhere to medical treatment (with eye drops or accept surgery as a means of vision preservation).

To kickstart the behavioural analysis, a desk review of local literature was carried out focusing on studies related to the glaucoma behaviours of interest – screening uptake, testing uptake, treatment uptake and adherence to medications and treatment regimes. The essence of the literature review was to (a) identify the factors (barriers and enablers) that influence the adoption of the stated behaviours of interest; and (b) determine areas of significant knowledge gaps which will receive more priority in this formative analysis.

The formative analysis was designed as a cross-sectional descriptive study complemented by qualitative techniques. The research was underpinned by two models and frameworks based on the behaviours of interest. The Capability, Opportunity, Motivation and Behaviour (COM-B) model was used to study the factors that spur the uptake of screening services in screening centres and hospital testing facilities (Behaviours 1 and 2) while the Health Belief Model (HBM) was used to study adherence to appointments and treatment (Behaviours 3 and 4). In applying both models and frameworks, the formative analysis was designed using mixed methods (mini surveys, focus group discussions and key informant interviews) to enable adequate triangulation of information.

Based on the formative analysis objectives, the study was pivoted in locations for the Sightsavers KeepSight pilot project: the University of Abuja Teaching Hospital (UATH) in Gwagwalada Area Council of the Federal Capital Territory (FCT), and the primary healthcare centre (PHC) in Dobi community, Gwagwalada. In terms of data collection tools, a COM-B glaucoma screening behaviour tool was administered to respondents at risk of glaucoma to understand why they visit or decline to visit screening and testing facilities.

The questionnaire - a five-point Likert scale ranging from “strongly disagree” to “strongly agree” and containing a series of behavioural statements on capacity, opportunity and motivation - was posed to the respondents. A mini questionnaire on demographics was also administered to all groups of respondents. Key informant interview (KII) and focus group discussion (FGD) question checklists were used to interview and gain further insights from clinicians/ophthalmologists, community-based volunteers, individuals diagnosed with glaucoma and individuals at risk of glaucoma. All the data collection tools developed were reviewed and validated by the Sightsavers team before they were used and opted for the study.

52 respondents were selected for the study amongst three categories of respondents as follows: 20 patients diagnosed with glaucoma (those adhering and not adhering to treatment) were selected from UATH case records; 20 individuals at risk of glaucoma were invited from the communities surrounding the PHC in Dobi; 10 community mobilisers or community drug distributors (CDDs) were selected from a pool of CDDs working for Sightsavers in the communities; and two key informants – an optometrist that anchors the screening process in the PHC and the ophthalmologist at UATH eye clinic where glaucoma patients are treated.

Key insights from the formative analysis were categorised into broad groups of critical enablers and barriers. For the enablers, the following six factors were identified as crucial facilitators to the expected behaviour changes:

1. **Desire to prevent blindness.** Generally, most people are proactive in protecting their sight for various reasons including personal wellbeing and security, social acceptance, ability to engage in economic activities etc. This desire is also supported by the widely held belief that eye health is important and that screening for eye health is beneficial.
2. **Appearance, intensity and severity of symptoms** were also found to be a significant factor, especially for Behaviours 1 and 2. Almost all the respondents showed up for screening and testing when they noticed some signs of reduced vision, and some pain and discomfort. While this factor is an enabler in this context, it is important to note that early detection is critical for vision preservation, especially for glaucoma patients. The intensity and severity of symptoms, although to a less degree, also encouraged people to adhere to their treatment and follow-on appointments.
3. **Quality of counselling and advice received from doctors** at each stage of care appeared to be another significant factor. Some respondents mentioned that the explanations they got from the doctors regarding their eye condition were crucial to their follow-on behaviour. The counselling received encouraged those referred to the testing facility to get tested, and others to adhere to their medical appointments.
4. **Social elements** (advice/help from family/friends, CDDs, traditional and religious authorities). Most respondents took a cue from friends and family members diagnosed with an eye disease or defect to go for screening/testing. Many also went for screening when the advice of the CDDs was reinforced by traditional and religious leaders. Family members were said to be of great help in reducing wastage when applying the eye drops (Behaviour 4) and in assisting respondents to go for testing and follow-on appointments (Behaviours 2 and 3).
5. **Fear of surgery, with associated misconceptions**, was a major factor that influenced people to choose (uptake) eye drops and medications as their preferred treatment option.
6. **Preference for one-off treatment** inspired some respondents to go for surgery rather than apply eye drops for life.

Likewise, seven barriers were identified as the most critical influencers to behaviour change, as follows:

1. **The belief that they are powerless and incapable of protecting their eyesight.** This belief is further entrenched by the fact that most of the respondents don't know what glaucoma is, neither do many know when or where to go for eye health screening. Some also believe that blindness comes with age, and some are aware that treatment does not

restore vision. Put together, these reasons demotivate many from going for eye screening or testing, or to continue with their treatment.

2. **Cost of care and treatment.** This cost increases significantly as we move from Behaviour 2 to 4. According to the ophthalmologist at UATH, a comprehensive eye test costs about 3,000 naira (for a central visual field test) or up to 12,000 naira (for an optical coherence test). A fee for registration (700 naira) and consultation (2,000 naira) also applies. Eye surgery for glaucoma cost about 40,000 naira (per eye) inclusive of drugs administered during surgery, and there's an admission fee for one night at the hospital. Eye drops cost between 2,500 and 7,000 naira per bottle depending on the manufacturer, and each bottle lasts for about one month. Because the UATH pharmacy often does not have the eye drops in stock, patients resort to buying from private pharmacies at a more exorbitant cost.
3. **Fear of surgery.** While this is an enabler for the uptake of eye drops as a preferred treatment option, conversely it is a direct barrier for the uptake of surgery. Most respondents heard stories of failed surgeries; others are aware that surgery does not restore their vision hence do not think it is a good option.
4. **The poor attitude of some healthcare workers** was identified by many as a key barrier and demotivator for most behaviours, but especially for Behaviour 3. Instances of verbal abuse, missing case files etc were reported by many respondents. It appears that some healthcare workers are unaware of the impact of their behaviour on their work and patients.
5. **Limited personnel, services and drugs at PHC and UATH** also came out as a key challenge for all behaviours. Most respondents complained that they spend the whole day waiting to see a doctor, at times only to be attended to by student doctors. In terms of services, at times patients are asked to go for some tests outside the hospital, and most often prescribed medication is not available in the hospital. At the screening centre, individuals who were diagnosed with other eye defects (other than glaucoma) do not receive any care or counsel. These categories of people return home upset, and discourage others from coming for screening.
6. **Treatment longevity** is another major barrier to adherence to follow-on appointments and treatment as most patients chose the medication option rather than surgery (for reasons earlier discussed). The implication is that they are expected to apply eye drops for life and this comes with attendant challenges including forgetfulness in applying the drops every day, as well as pain and discomfort felt with the eye drops.
7. **Lack of visible improvements from treatment.** Glaucoma treatment by nature does not restore vision, rather it maintains the status of the eye when treatment was commenced and prevents the eye from deteriorating further. However, most patients get discouraged with time when they do not see marked improvements in their vision.

Following the prioritisation of key insights in the above section, the study proceeded to propose intervention types and specific actions aimed at achieving expected outcomes per target behaviours. The specific intervention actions were mostly derived from the suggestions by the primary study respondents (individuals at risk of glaucoma, patients diagnosed with glaucoma, CDDs) including the clinicians who served as key informants.

Also, a few suggestions from literature on ways to support individuals on lifelong medication to adhere to their treatment regimens were added.

To jointly improve attendance to eye health screening centres (Behaviour 1) and hospital testing facilities (Behaviour 2), four related outcomes must be achieved.

These include enhancing individuals' belief in both the existence of diseases that can cause them to become blind without their knowledge, and in their ability to protect their eyesight; individuals at risk adopting the practice of going for regular eye checks even without having any symptoms; improving access to eye screening at PHC and clinical services at UATH; and making the cost of care (eye testing) more affordable.

- To strengthen belief, the following actions were proposed: sensitisation and enlightenment activities to enhance knowledge on eye diseases that cause a gradual loss of sight and how people can protect their eyesight; and design communication materials on ways people can protect their eyesight and disseminate these materials using appropriate channels and sources (including community mobilisers, traditional and religious leaders) to stimulate desired behaviour change.
- Promoting the culture of at-risk individuals attending regular eye checks (even without having any symptoms) requires the following actions: awareness creation sessions on the dangers of late detection of eye diseases; re-training of community mobilisers on negotiation and persuasion skills; increasing logistics stipends for the mobilisers to enable proper coverage of catchment areas including repeated visits to individuals at risk for persuasion and follow-ups; provision of incentives (goggle frames, eye drops, over-the-counter medications etc) during screening days to spur attendance; use of eye pictures to show the effects of late detection of eye defects; identification and sharing of testimonials and success stories on early detection; and mounting signages at PHC (with inscriptions on local language) to sensitise people on the eye care services available.
- To improve access to eye screening at PHC and clinical services at UATH, the number of staff available to patients and/or the number of clinic days should be increased to ensure that patients spend a minimal amount of time in the facilities. At the PHC, interventions should be expanded to cover other eye diseases like cataract.
- Regarding the affordability of eye testing, the potential of seeking funding to introduce subsidies and to organise free medical outreaches should be explored alongside the possibility of stimulating increased individual and private sector corporate social responsibility (CSR) contributions.

To further improve eye-testing seeking behaviour (Behaviour 2) and achieve increased attendance to regular follow-on appointments (Behaviour 3), the poor attitude exhibited by some healthcare workers should be addressed.

The target outcome is to ensure that healthcare workers become more empathetic and supportive of patients.

- To this end, interactive sessions should be held to discuss the effect of healthcare workers' actions on patients and how to overcome challenges and be more supportive. Healthcare workers should be retrained on professional ethics and soft skills including negotiation and communication skills. A monthly award could be introduced to reward and recognise healthcare workers that excel in patient management and care; simultaneously hospital rules on patient care and management should be enforced.

Influencing attendance to regular follow-on appointments (Behaviour 3) and adherence to treatment (Behaviour 4) require attaining four related outcomes - making the cost of care and treatment (surgery and eye drops) more affordable, increasing the availability of eye medications in the UATH pharmacy, increasing acceptance and adherence to medication treatment (despite a lack of visible improvements), and strengthening patients' ability to cope with treatment longevity and associated discomforts.

- To reduce cost, the following are proposed: fundraising efforts to enable the introduction of subsidies and free medical outreaches; supporting patients to sign up to the national health insurance scheme (NHIS); advocacy to the government to include more glaucoma drugs in the NHIS and allocate more funds to glaucoma treatment and eye health; and stimulating more individual and private sector CSR contributions.
- Regarding increasing the availability of eye medication in the UATH pharmacy, advocacy to relevant UATH authorities and working towards stimulating increased individual and private sector CSR contributions are suggested.
- On improving acceptance and adherence to increased medication treatment (despite a lack of visible improvements), enlightenment events should be held to enhance knowledge on glaucoma and treatment purpose/outcomes, and patients should be shown the effects of non-adherence to treatment.
- To strengthen a patient's ability to cope with treatment longevity and associated discomforts, sensitisation sessions should be held to educate patients on proven ways to cope with their treatment plans. Communication materials on coping strategies for long-term treatment regimen should be designed and disseminated, and peer forums/support groups should be created and supported to ensure that patients continue to encourage and motivate each other.

Lastly, to improve uptake of surgery, patients' acceptance of surgery as a means of vision preservation must be strengthened. To achieve this, awareness creation events on the pros and cons of surgery as a treatment option should be organised; individual and/or group counselling opportunities should be made available; SBC materials to stimulate acceptance of surgery should be designed and disseminated; and surgery-related testimonials and success stories should be shared.

In terms of the next steps, Sightsavers should review the proposed intervention actions alongside the key insights from the study. Proposed actions could be further restructured into two categories of short-term solutions (quick wins within Sightsavers' manageable interests, scope and capacity) and longer-term interventions (system-wide solutions that require other stakeholders external to the project).

1. Introduction

Glaucoma is the most common cause of irreversible blindness, and the second leading cause of blindness worldwide. Also referred to as ‘the silent thief of sight’, it is a disease that erodes the optic nerve and depletes peripheral vision, thus making it difficult to notice in its early stages by the person. It is characterised by optic nerve damage and visual field loss which, if left untreated, progresses to blindness. Black race (African origin) and increased intraocular pressure are important risk factors. However, if detected and treated early in its progression, glaucoma can be slowed and serious vision loss delayed or prevented.

The Sightsavers KeepSight project seeks to integrate and enhance glaucoma management into existing eye care services to reduce the number of people going blind due to untreated glaucoma. The project will be executed initially in the Federal Capital Territory (FCT) of Abuja in the pilot phase. This will entail community screening for people at risk of glaucoma, and clinical assessment of people referred from the communities or adults self-reporting at the hospital.

The project will adopt a social behaviour change (SBC) approach to identify key stakeholders and influencers in eye health and communities to carry out specific behavioural change interventions. The KeepSight project seeks to prioritise the following behaviours:

1. Men and women over 40 who are at risk of glaucoma attend a screening centre.
2. Men and women over 40 who are at risk of glaucoma attend a hospital testing facility.
3. People with a glaucoma diagnosis attend regular follow-up appointments.
4. People with a glaucoma diagnosis adhere to medical treatment (with eye drops or accept surgery as a means of vision preservation).

Although the project understands some of the reasons why people fail to seek care against glaucoma (mostly from the review of global literature), formative research nonetheless is needed to determine the local drivers of these behaviours. As an output, findings from this formative evaluation will help the project evolve localised solutions and design appropriate SBC materials and behavioural change interventions to align with the aspirations and contexts of the primary stakeholders.

2. Literature review

2.1. Conceptual framework

This formative research is underpinned by two models and frameworks based on the behaviours of interest stated above. To study the barriers and enablers to the uptake of glaucoma screening either in screening centres or at hospital testing facilities (Behaviours 1 and 2), the Capability, Opportunity, Motivation and Behaviour (COM-B) model was used as a framework for analysis. To study adherence to appointments and treatment (Behaviours 3 and 4), the Health Belief Model (HBM) was adopted.

2.1.1. Capability, Opportunity, Motivation and Behaviour Model

The Capability, Opportunity, Motivation and Behaviour (COM-B) model is a theory of behaviour change that facilitates the understanding of barriers and enablers of behaviour change. Developed by Michie et al [5], the model guides the understanding of any behaviour of interest and facilitates the identification of behaviour targets which can become the basis for intervention design. The model proposes that for a person to engage in any behaviour (B), the individual needs to be physically and psychologically capable (C) to use social and physical opportunities (O) via motivators (M) that are reflective or automatic.

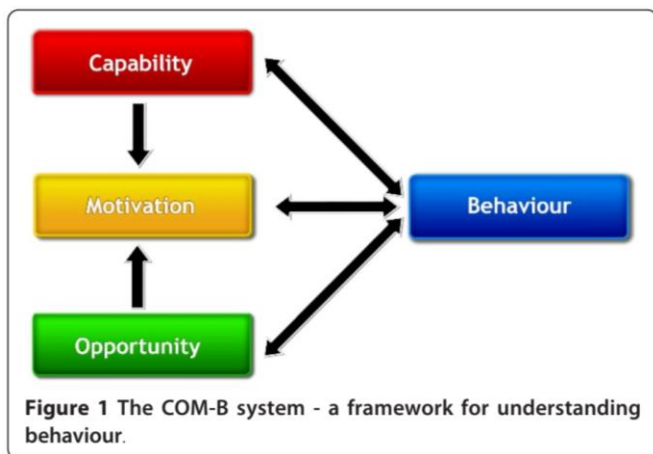


Figure 1: The COM-B model framework

In this behaviour system, capability, opportunity and motivation interact to generate behaviour that in turn influences these components shown in Figure 1.

- **Capability** is defined as the individual's psychological and physical capacity to engage in the activity concerned. It includes having the necessary knowledge and skills.
- **Opportunity** is defined as all the factors that lie outside the individual that make the behaviour possible or prompt it.
- **Motivation** is defined as all those brain processes that energise and direct behaviour, not just goals and conscious decision-making. It includes habitual processes and emotional responding, as well as analytical decision-making.
- **The single-headed and double-headed arrows** represent potential influence between components in the system. For example, opportunity can influence motivation as can capability; and enacting a behaviour can alter capability, motivation and opportunity.

While this is a model of behaviour change, it also provides a basis for designing interventions aimed at behaviour change. Applying this to intervention design, the task would be to consider what the behavioural target would be, and what components of the behaviour system would need to be changed to achieve that. [5]

The benefit of employing the COM-B model over a single theory of behaviour is that several distinct and explanatory components connecting the individual and the immediate social environment are outlined. COM-B lies at the centre of the Behaviour Change Wheel (BCW), a toolkit for designing behaviour change interventions [1] and is the starting point of intervention development.

COM-B components can be mapped onto the BCW and the Behaviour Change Technique Taxonomy, which facilitates the selection of intervention strategies that are likely to be appropriate and effective in addressing the barriers and enablers for each component [1].

The COM-B model has been successfully applied to investigate various health behaviours. For example, it was used to study barriers and facilitators to chlamydia testing in general practice for young people and primary care practitioners [1], barriers and enablers to delivery of the Healthy Kids Check [2], and to study medication adherence [3]. In this formative analysis, the COM-B model will be applied to provide insights on the uptake of glaucoma screening and testing services.

2.1.2. Health Belief Model

Factors influencing people with a glaucoma diagnosis to attend regular follow-up appointments and adhere to medical treatment (Behaviours 3 and 4) will be analysed using the Health Belief Model (HBM).

The HBM has been one of the most widely used conceptual frameworks in health behaviour research, both to explain the change of health-related behaviours and as a guiding framework for interventions. HBM contains several primary components (or constructs) that predict whether and why people will take action to prevent, detect or control illness conditions. These constructs include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy.[7] These constructs influence health behaviour, often alongside other intrapersonal modifying factors (e.g. age, gender and health literacy) [8].

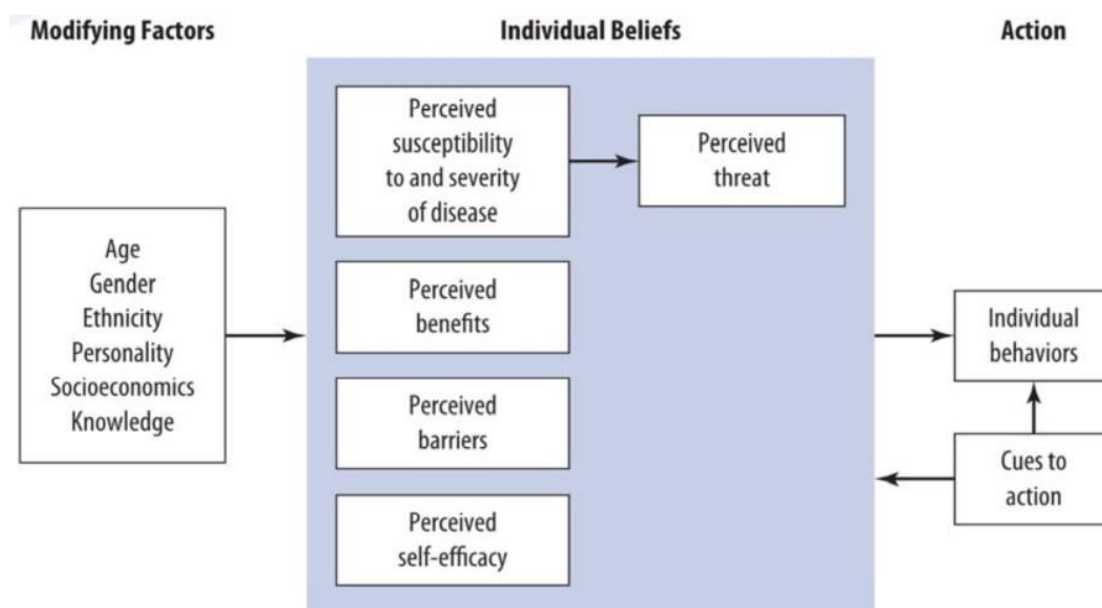


Figure 2: Health Belief Model and components

The overall premise of the HBM is that people are likely to engage in a health behaviour if they believe that they are susceptible to a condition (at risk for a disease); the condition could have potentially serious consequences; a course of action (behaviour) available to them could be of benefit in reducing either susceptibility to or the severity of the condition; there are benefits to taking action; or their perceived barriers (or costs) are outweighed by the benefits and are not strong enough to prevent action.

The use of HBM has also been applied to study patients' adherence to the treatment of eye diseases including glaucoma. In 2013, research was conducted on the use of the Glaucoma Treatment Compliance Assessment Tool (GTCAT) as a questionnaire, designed according to the HBM, to assess adherence with glaucoma therapy. Hence, in applying the HBM to this formative analysis, the definitions of the model components were adapted per the GTCAT research findings as follows [9]:

- Perceived severity – one's opinion of how serious glaucoma and its consequences are.
- Perceived susceptibility - one's opinion of the chances of developing worsening glaucoma.
- Perceived benefits - one's belief in the efficacy of eye drops or surgery to reduce the risk or seriousness of glaucoma.
- Perceived barriers - one's opinion of the tangible and psychological costs of taking eye drops or undergoing surgery.
- Cues to action - external strategies or encouragements to take eye drops or undergo surgery.
- Self-efficacy - confidence in your ability to use eye drops correctly and effectively.
- Other reasons – such as education, medical staff approach or depression.

2.2. Review of relevant literature

A desk review of local literature was carried out focusing on studies related to the glaucoma behaviours of interest: screening uptake, testing uptake, treatment uptake, and adherence to medications and treatment regimes. The essence of the literature review was to (a) identify the factors (barriers and enablers) that influence the adoption of the stated behaviours of interest, and (b) determine areas of significant knowledge gaps which will receive more priority in this formative analysis.

ResearchGate, a professional networking database for scientists and researchers, was used to anchor the search of relevant literature. The database provided access to published materials from various high-impact peer-reviewed journals and other databases including the Open Journal of Ophthalmology, PubMed, Global Health Action, Medline, SAGE Journals, Springer etc. Additional resources were obtained through the review of the citation list of the downloaded materials.

After scanning the web for the relevant materials, 55 eye health and glaucoma-related research conducted in Nigeria were downloaded. These were screened for inclusion in this study based on the following criteria: studies conducted not later than 2010 (10 years ago); studies covering the uptake of general eye health screening and/or testing; uptake of glaucoma treatment; and adherence to glaucoma treatment protocols. From the screening exercise, 18 studies (see Annexe 1) met the criteria and were used to conduct the initial mapping and diagnoses of both the COM-B model and HBM.

2.2.1. COM-B model mapping

Findings from the literature review were mapped into the COM-B model (see Table 1) to (a) find out barriers and facilitators in terms of capability (physical and psychological), opportunity (physical and social) and motivation (reflective and automatic) in people with undiagnosed glaucoma to improve uptake in screening and testing, and (b) determine gaps for further inquiry during the formative analysis.

Table 1: Mapping of literature review findings on the uptake of eye health screening and testing behaviours* into the COM-B model

COM-B model components	Sub-components	Barriers/enablers to the uptake of eye health screening and testing
Capability Individual's psychological and physical capacity to engage in the activity concerned [5]	Physical capability Capacity to engage in the necessary physical processes et al [5]	
	Psychological or mental capability Capacity to engage in the necessary thought - comprehension, reasoning [5]	<ul style="list-style-type: none"> Knowledge/awareness of eye diseases (glaucoma) [15], [16], [33]
Opportunity Factors that lie outside the individual that make the behaviour possible or prompt it [5]	Physical opportunity The opportunity afforded by the environment [5]	<ul style="list-style-type: none"> Difficulty in getting doctor's appointment [32] Difficulty in getting time off work [32] Long waiting periods at the clinic [32]
	Social opportunity Afforded by the cultural milieu that dictates the way we think about things (e.g. the words and concepts that make up our language) [5]	<ul style="list-style-type: none"> Family interference [32] Positive family history [15], 32]
Motivation Brain processes that energise and direct behaviour [5]	Automatic motivation Emotions and impulses arising from associative learning and/or innate dispositions [5]	<ul style="list-style-type: none"> Fear of treatment option [32] Noticeable symptoms [32]
	Reflective motivation Involving evaluation and plans [5]	<ul style="list-style-type: none"> Cost [32] Perceived severity [32] Perception of importance of the eye [32] Perception of the need for screening [33]

COM-B model components	Sub-components	Barriers/enablers to the uptake of eye health screening and testing
Other factors		<ul style="list-style-type: none"> • Education [15], [32] • Gender [15]
No effect		<ul style="list-style-type: none"> • Age [15] • Level of education [15] • Sending SMS reminders [18]

* Most studies used the term 'eye screening' to represent both screening and testing. Usually, people with eye health problems simply come to the hospital and get screened/tested at the same time. This was also apparent during the interactions with study respondents who are glaucoma patients - most of them simply came to the hospital to present their symptoms and were screened/tested/diagnosed.

2.2.2. Health Belief Model (HBM) mapping

Similarly, findings from the literature review were mapped into the HBM model (see Table 2) to (a) identify the factors influencing adherence to medical treatment (Behaviour 4) amongst persons diagnosed with glaucoma, and (b) determine gaps for further inquiry during the formative analysis. Information in Table 2 excludes Behaviour 3 (attendance to regular follow-up medical appointments) due to the dearth in available local eye-health literature.

Table 2: Mapping of literature review findings on the uptake and adherence to glaucoma treatment regimens into the HBM

HBM components		Barriers and enablers to the uptake* and adherence to glaucoma treatment
Individual beliefs	Perceived susceptibility Beliefs about the chances of developing worsening glaucoma [7]	<ul style="list-style-type: none"> • Perception of patients concerning glaucoma blindness [19]
	Perceived severity Beliefs about the seriousness of glaucoma including its consequences [7]	<ul style="list-style-type: none"> • Need not seen [22] • Advanced stage of glaucoma [24], [29], [30] • Fear of going blind [25], [28] • Advanced loss of sight [17]
	Perceived benefits Beliefs about the positive aspects of uptake and adherence to glaucoma treatment protocols [7]	<ul style="list-style-type: none"> • The desire for improved vision [28]
	Perceived barriers	<ul style="list-style-type: none"> • Cost of treatment [16], [17], [21], [22], [23], [25], [26], [27], [28], [29]

HBM components		Barriers and enablers to the uptake* and adherence to glaucoma treatment
	Beliefs about the obstacles and possible negative effects (tangible and psychological costs) of accepting and adhering to glaucoma treatment [7]	<ul style="list-style-type: none"> • Fear of treatment [21], [22], [23] • Prefers medical treatment [21], [22] • Bad experience of others [22] • Surgery not 100 per cent curative [22] • No improvement after surgery [22] • Side effects after surgery [22], [28], [29] • Distance to hospital [27] • The attitude of hospital staff [23], [27] • Duration of treatment [26], [29] • Availability of medication [28] • Number of medications [28] • Convenient application schedule [28]
	<p>Self-efficacy</p> <p>The individual's personal belief and confidence that they can perform the recommended health behaviour (e.g. correct and effective use of eye drops) [7]</p>	<ul style="list-style-type: none"> • Inability to administer the medications properly [25], [28], [29] • Understanding the application instructions for each medication [25] • Busy schedule [28]
Action	<p>Cues to action</p> <p>Internal or external factors (strategies or encouragements) that can trigger an individual to accept and adhere to glaucoma treatment [7]</p>	<ul style="list-style-type: none"> • Forgetfulness [23] [28], [29] • Use of alarm reminders [28] • Display drug by bedside [28] • Reminders by family members [28] • Carry the drugs everywhere [28] • Motivational interviewing [20]
	Modifying factors	<ul style="list-style-type: none"> • Knowledge of glaucoma [16], [27], [28] • Knowledge of where to find care [17] • Patient's income size [26] • Age [26] • Info on diagnosis [27]
	No effect	<ul style="list-style-type: none"> • Age [19] • Gender [19] • Marital status [29] • Level of education [19], [29] • Family history of glaucoma [19] • Prior awareness of glaucoma diagnosis [19] • Number of medications [25]

HBM components	Barriers and enablers to the uptake* and adherence to glaucoma treatment
	<ul style="list-style-type: none"> • Being single/alone [25] • Appreciation of the effects of the drugs [26]

*As seen from the studies reviewed, the term ‘uptake’ refers strictly to acceptance of surgery amongst patients diagnosed with glaucoma, unlike ‘adherence to treatment’ which applies to patients on life-long medication (use of eye drops etc).

2.2.3. Framing of the formative analysis

From the search of literature and mapping of findings, it is evident that most studies in Nigeria have used the HBM extensively to successfully understand the various aspects of eye health-related behaviour change (especially for glaucoma). This study, hence, did not attempt to duplicate the findings from local literature. Instead, this analysis dug deeper using qualitative tools to understand the ‘why’ behind the findings of the referenced literature, especially in the context of the project communities of interest. In doing this, new or context-related information discovered was analysed and included in the findings. The findings from HBM literature also helped us prioritise which barriers and enablers are most significant.

In contrast, only a few studies in Nigeria have used the COM-B model to explore eye health-related behaviour change. This study adopted the model - and especially its set of quantitative and qualitative tools - to explore the barriers and enablers to the uptake of eye health screening and testing. The findings from COM-B literature were also used to adapt the quantitative tools and develop the qualitative tools to focus and deepen the inquiry.

Both the COM-B model and HBM have some gaps. For instance, while the COM-B model does not directly look at barriers and threats to behavioural change, the HBM does not consider motivation, emotion and other social and environmental influences such as culture. To compensate for these gaps, the study expanded its qualitative tools beyond the traditional scope and components of both models to obtain insights on all factors that could influence their behaviour.

3. Methodology

3.1. Research design

This formative analysis was designed as a cross-sectional descriptive study complemented by qualitative techniques. As stated earlier, the research was underpinned by two models and frameworks based on the behaviours of interest. The COM-B model was used to study the factors that spur the uptake of screening services in screening centres and hospital testing facilities (Behaviours 1 and 2), while the HBM was used to study adherence to appointments and treatment (Behaviours 3 and 4). In applying both models and frameworks, the formative analysis was designed using mixed methods (mini surveys, focus group discussions and key informant interviews) to enable adequate triangulation of information.

3.2. Study area

Based on the formative analysis objectives, the study was pivoted in locations for the Sightsavers KeepSight pilot project – the University of Abuja Teaching Hospital (UATH) in Gwagwalada Area Council of the Federal Capital Territory (FCT), and the primary healthcare centre (PHC) in Dobi community, Gwagwalada.

Gwagwalada, a growing urban area, is among the six area councils in the FCT and one of its largest settlements. It is located on route A2, Kaduna-Lokoja road, about 55km from the FCT city centre. Gwagwalada Area Council lies between latitude 8° 55'N and 9° 00'N and longitude 7° 00'E and 7° 05'E. It is bordered by Kuje Area Council to the East, Abaji Area Council to the West, Kwali Area Council to the South, Abuja Municipal Area Council to the Northeast, and Suleja Local Government Area of Niger State to the North [31]. Also, Dobi community is located between latitude 8° 55'N and longitude 7° 00'E, [10] and is about 10km from the UATH in Gwagwalada town.

The PHC in Dobi offers eye screening services for glaucoma for residents of Dobi and surrounding communities including Paiko, Shaku, Kaimuko etc. From the PHC, individuals with positive preliminary examination for glaucoma are referred to the University of Abuja Teaching Hospital (UATH) for comprehensive testing and treatment (if glaucoma is confirmed). UATH also receives patients directly for screening and treatment for various eye defects and diseases from all communities in Gwagwalada and beyond the area council.

3.3. Sampling technique

A purposive sampling method was used to identify respondents of interest as follows:

- For patients diagnosed with glaucoma, staff at the UATH eye clinic used the Eight-item Morisky Medication Adherence Scale to determine glaucoma patients who were adhering to their treatment regimen, and those not adhering. 10 people were invited from each cohort based on their availability.
- For individuals at risk of glaucoma, the community drug distributors (CDDs) identified 20 individuals at risk of glaucoma (mostly those aged over 40, and those who have not attended any eye-health screening) from Dobi and nearby communities including Alade Na Obama, Paiko, Ungwan Sarki Fulani Ngali, Shaku, Ungwan Kasa and Kaimuko - all in Gwagwalada Area Council.
- Both the ophthalmologist and optometrist (respondents for the key informant interviews) were also selected purposively. The optometrist anchors the screening processing in the PHC at Dobi, while the ophthalmologist oversees the UATH eye clinic where patients with glaucoma are treated.
- The CDDs were also selected purposively based on their availability.

In all, a total of 52 respondents were selected for the study, See Table 3 for the distribution of respondents per category and interview method.

3.4. Interview techniques and tools

As mentioned, the research was designed using mixed methods (mini surveys, focus group discussions and key informant interviews) to enable adequate analysis and triangulation of data. The qualitative analysis is key to understanding the enablers and barriers to the behaviours occurring.

- A COM-B glaucoma screening behaviour tool (**see Annexe 3**) was administered to respondents at risk of glaucoma to understand why they visit or decline to visit screening and testing facilities. The questionnaire, a five-point Likert scale ranging from “strongly disagree” to “strongly agree” containing a series of behavioural statements on capacity, opportunity and motivation was posed to the respondents.
- A mini questionnaire on demographics was administered to all groups of respondents (**see Annexe 3**).
- Key informant interview (KII) and focus group discussion (FGD) question checklists (**see Annexe 3**) were used to interview and gain further insights from clinicians/ophthalmologists, community-based volunteers, individuals diagnosed with glaucoma and individuals at risk of glaucoma.

All the data collection tools developed were reviewed and validated by the Sightsavers team before they were used and opted for the study.

3.5. Data collection

To improve the quality of data collection, data processing and data analysis, all the tools developed (excluding the KII and FGD checklists) were programmed into **KoBoToolbox** to facilitate electronic data collection. The KIIs were recorded and transcribed using Otter software, while the FGDs were recorded using an Android mobile phone recording application and transcribed manually.

Patients diagnosed with glaucoma were mobilised by the UATH team for interviews within the UATH premises, while those at risk of glaucoma were identified within the Dobi community by the CDDs and invited for interviews at the PHC in Dobi. The ophthalmologist was interviewed at UATH while the optometrist was interviewed at the PHC in Dobi.

Two experienced enumerators supported the lead researcher to administer the study tools. All interviews were conducted face-to-face with the respondents.

Table 3: Summary of research methodology

Venue and date	Respondent category	Interview tools and techniques	Sample size
UATH Gwagwalada town, 22 December 2020	Patients diagnosed with glaucoma (those adhering and those not adhering to treatment)	One FGD - male Demographics survey	20 persons
		One FGD - female Demographics survey	
	Ophthalmologist	Key informant interview	One person
PHC Dobi, 23 December 2020	Men and women over 40 at risk of glaucoma	One FGD - male demographics survey COM-B survey	20 persons
		One FGD - female demographics survey COM-B survey	
	Community Drug Distributors (CDDs)	One FGD	10 persons
	Optometrist	Key informant interview	One male

4. Findings and discussion

4.1. Demographics of primary respondents

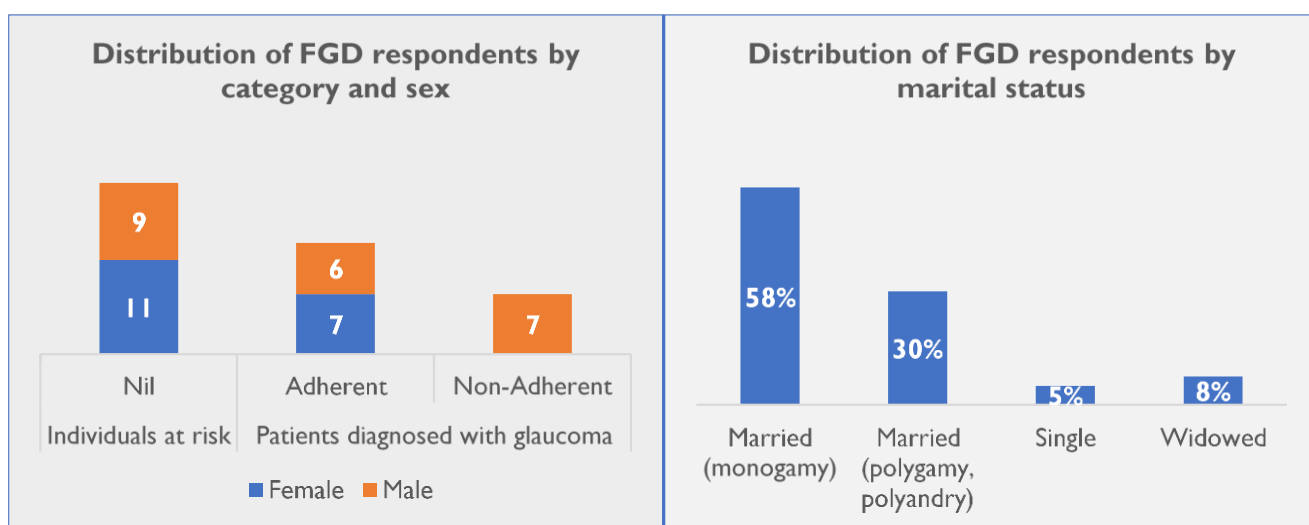


Figure 3: Distribution of FGD respondents by category, sex and marital status

Forty primary respondents (20 individuals at risk of glaucoma and 20 patients diagnosed with glaucoma) were interviewed in the FGDs. 55 per cent (11) of the individuals at risk of

glaucoma are female. Hospital case records show that 65 per cent (13) of the patients diagnosed with glaucoma are adhering to their treatment regimen; amongst this compliant group, 53 per cent (seven) are females. All non-compliant patients are male.

The mean age of respondents is 54 years (standard deviation of 13), the minimum age of respondents is 18 years and the maximum age is 79 years. In terms of marital status, 88 per cent (35) of the respondents are married and eight per cent (three) are widowed.

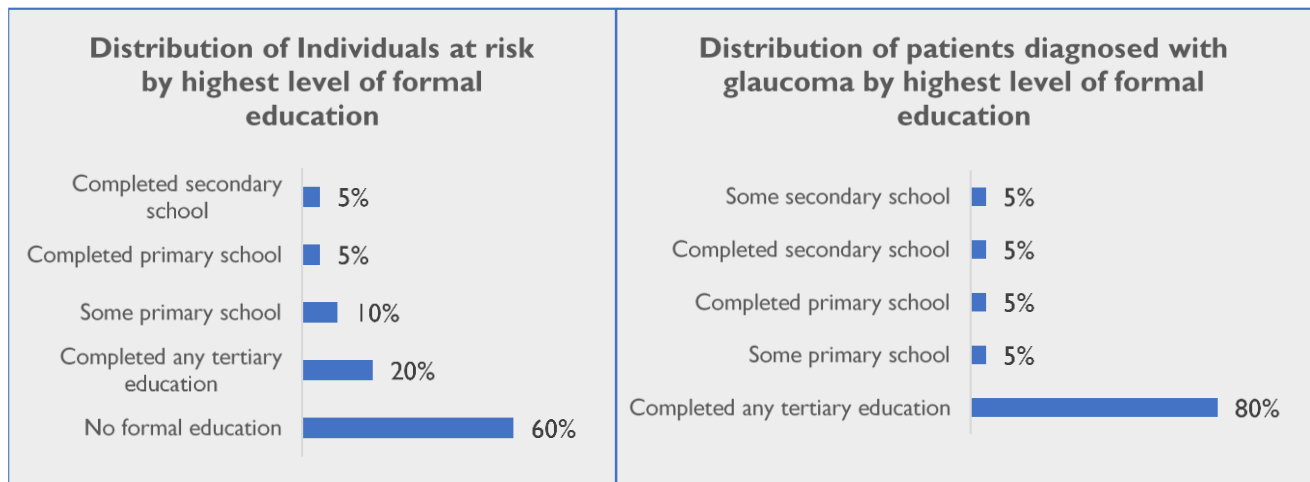


Figure 4: Distribution of FGD respondents by category and highest level of formal education

The respondents' highest level of formal education was also enquired upon. Findings show that 50 per cent (20) of the respondents completed tertiary education, 30 per cent (12) had no formal education while eight per cent (three) had some form of primary school education. When disaggregated by respondent category, as shown in Figure 4, findings show that most (80 per cent) of the study patients diagnosed with glaucoma have completed one form of tertiary education. In contrast, the majority (60 per cent) of the individuals at risk of glaucoma had no formal education. Although the study sample is limited, the contrast observed in the level of education aligns with findings from the literature review which highlighted education as one of the enablers to the uptake of eye health screening behaviour.

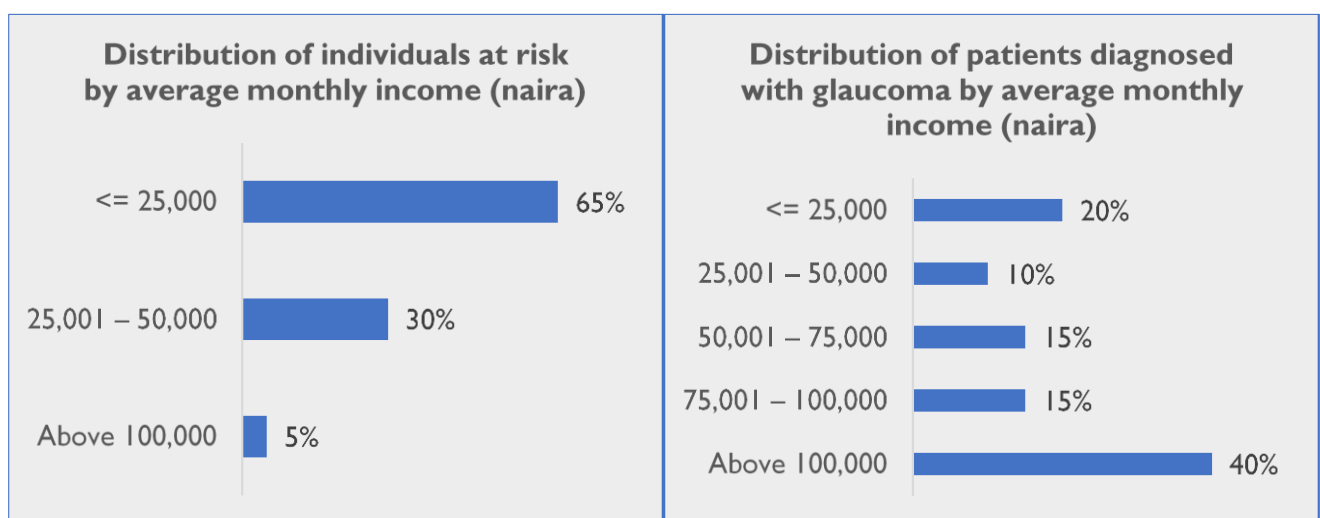


Figure 5: Distribution of FGD respondents by category and average monthly income (naira)

On average monthly income, 43 per cent of the respondents (17) earn 25,000 naira or less, 23 per cent (nine) earn above 100,000 naira and 20 per cent (eight) earn between 25,000 and 50,000 naira. Looking at both respondent cohorts (see Figure 5) we find that most (40 per cent) of the patients diagnosed with glaucoma earn above 100,000 naira monthly unlike the individuals at risk where the majority (65 per cent) earn less than 25,000 naira monthly.

Put together, the demographics data showed that the respondents (especially the patients diagnosed with glaucoma) are generally literate and experienced as evidenced by their educational level, age and average monthly income. These characteristics are crucial as they correlate with the strength of communication and the quality of the insights provided by the respondents. For the patients diagnosed with glaucoma, having a mix of those adhering to treatment and those not complying helped to improve the variety of responses and insights gotten on the two contrasting behaviours.

4.2. Attending eye health screening centres

4.2.1. Results from the COM-B model survey

As detailed in section 3.4, the COM-B glaucoma screening behaviour tool was administered on respondents at risk of glaucoma to understand why they visit or decline to visit the PHC for eye health screening. The mean for the responses for each individual COM-B model statements was calculated, categorised into “agree” (3.5 and above), “neutral” (≥ 2.5 and < 3.5) and “disagree” (< 2.5), and ranked (biggest mean score as first).

Table 4: Ranking of COM-B responses on people at risk of glaucoma attend a screening centre

Behavioural Statements	Mean	Std. dev.	Category	Ranking
Capability				
Physical capability				
I have the physical ability to get to an eye health screening	4.2	1.0	Agree	5
I need support to go through an eye health screening process	3.5	1.3	Agree	11
Psychological capability				
I know what glaucoma is	1.4	0.9	Disagree	25
I am at risk of glaucoma	3.1	1.2	Neutral	13
I am unlikely to get glaucoma	2.8	0.9	Neutral	17
I know when I need to go for eye health screening	2.9	1.3	Neutral	16
I know where to go for eye health screening	3.0	1.5	Neutral	15

Behavioural Statements	Mean	Std. dev.	Category	Ranking
I know why I need to go for eye health screening	4.0	1.2	Agree	6
Opportunity				
Physical opportunity				
There are eye health screening centres in my community or surrounding communities	1.9	1.3	Disagree	23
The available screening centres are close to my residence	1.5	1.1	Disagree	24
I have enough time to go for screening	4.8	0.4	Agree	3
Eye health screening is affordable to me	3.0	1.2	Neutral	14
Social opportunity				
I have a friend or family member diagnosed with an eye disease or defect	3.6	1.7	Agree	9
Our culture supports screening for an eye disease or defect	3.6	1.5	Agree	10
Most people in my community go for eye screening	3.3	1.1	Neutral	12
We have a family practice of taking care of our eye health	2.1	1.4	Disagree	21
Motivation				
Reflective motivation				
I do not think there is anything I can do to protect my sight	4.0	1.3	Agree	7
I believe that screening for eye health is beneficial	4.9	0.4	Agree	2
I am afraid of being diagnosed with any eye disease or defect	2.5	1.5	Neutral	19
Automatic motivation				
I think eye health is important	5.0	0.2	Agree	1
I think eye health is less important than other parts of my health	2.0	1.5	Disagree	22

Behavioural Statements	Mean	Std. dev.	Category	Ranking
I want to be more proactive in protecting my sight	4.6	0.5	Agree	4
Those who go for eye health screening receive some incentives	2.8	1.2	Neutral	18
Others				
Eye health is more important to a man than a woman	2.3	1.5	Disagree	20
People with formal education are more likely to go for eye screening	3.8	1.3	Agree	8

Results from **Table 4** showed that the respondents agreed to 11 of the 25 individual statements, disagreed with six, and were undecided with eight statements. Highlights of the individual behavioural statements are explored below:

Regarding **physical capability** (capacity to engage in the necessary physical processes), the respondents stated that while they have the physical ability to get to an eye health screening (mean - 4.2/5), they need support to go through an eye health screening process (mean - 3.4/5).

In terms of **psychological capability** (capacity to engage in the necessary thought - comprehension, reasoning) most of the respondents confirmed that they do not know what glaucoma is (mean - 1.4/5). They were also unsure when asked: if they are at risk of glaucoma (mean – 3.1/5); if they are unlikely to get glaucoma (mean - 2.8/5); if they know when to go for health screening (mean – 2.9/5); and if they know where to go for eye health screening (mean – 3.0/5). However, most agreed that they know why they need to go for eye health screening (mean – 4.0/5).

On **physical opportunity** (opportunity afforded by the environment), the respondents disagreed that there are eye health screening centres in their community or surrounding communities (mean – 1.9/5), and that the available screening centres are close to their residence (mean – 1.5/5). When asked if eye health screening is affordable to them, they were indecisive (mean – 3.0/5), perhaps unsure of the cost. However, most did agree that they have enough time to go for eye health screening (4.8/5).

About **social opportunity** (opportunity afforded by the cultural milieu that dictates the way we think about things), most respondents agreed that they have a friend or family member diagnosed with an eye disease or defect (mean – 3.6/5) and that their culture supports screening for an eye disease or defect (mean – 3.6/5). However, they did not agree that most people in their community go for eye screening (mean – 3.3/5) and they disagreed with the statement that they have a family practice of taking care of eye health (mean – 2.1/5).

Concerning **reflective motivation** (involving evaluation and plans), most of the respondents confirmed that they do not think that there is anything they can do to protect their sight (mean – 4.0/5), but then they believe that screening for eye health is beneficial (4.9/5).

However, they were undecided when asked if they are afraid of being diagnosed with any eye disease or defect (mean – 2.5/5).

Concerning **automatic motivation** (emotions and impulses arising from associative learning and/or innate dispositions), all the respondents agreed that eye health is important (mean – 5.0/5). The majority also agreed that they want to be more proactive in protecting their sight (mean – 4.6/5). Most disagreed with the statement that eye health is less important than other parts of their health (mean – 2.0/5), while most were undecided to the statement that those who go for eye health screening receive some incentives (mean – 2.8/5).

About **other factors** explored, most of the respondents disagreed that eye health is more important to a man than a woman (mean – 2.3/5). They, however, agreed that people with formal education are more likely to go for eye screening (mean – 3.8/5).

4.2.2. Focus group discussion (FGD) responses

Feedback from men and women at risk of glaucoma interviewed in FGDs at the PHC in Dobi are categorised in the sections below.

4.2.2.1. Perception of the importance of the eyes

When asked about how important seeking care for eye health is, both male and female respondents stated that the eye is a very crucial part of the body which determines, to a great extent, their ability to engage in economic, social, religious and educational activities. Loss of eyesight, they believe, completely dehumanises an individual (see **Boxes 1 and 2**).

“Seeking care for my health is important because the eye is a very important part of the body. Without the eyes, one cannot do anything at all. What we use our hands and other parts to do, we always need the eyes to see them.”

“Without the eyes one is dead. That is why taking care of our sight is important. If we do not take care of it and something happens to our sight, it means we are like dead people, we can't do what other people are doing.”

“It is very important because without the eyes, you can't see light and you become immobile, you can't go anywhere. Sometimes when I come out in the morning, my eyes are very weak, they remind me that I am old, and I cannot see like before again. If I stop seeing it means I can't go anywhere again.”

Box 1: Extracts from FGD transcripts: females at risk of glaucoma

“It is very important. Because the eye is one part of the human body that if you lose it, your whole activity stops, you will be needing a guide to go about, so eye health is important.”

“Eye health is important because if you lose it, you have lost your body even because you will not be productive until you are helped. Eye health is very important to the human body, it is a main part of the body that if lost, the whole body is lost.”

“The fact is that the eyes that you see are one's world. If there is no sight, you don't know how your surrounding is, there is a snake you can't tell, there is a hole, there is fire, if people are running until someone guides you, you will be cheated, but a crippled person can hide, you without eyes are at the mercy of the world. Your eyes are the window to the world. It is through the eyes you see the world and know how it is but if there is no sight, completely you are in the dark.”

“If someone loses his sight, he is finished, he is dead. What will he do? You just stay at home.”

Box 2: Extracts from FGD transcripts: males at risk of glaucoma

4.2.2.2. Factors that enable uptake of eye health screening

When asked to explain the factors and enablers that motivate and help people to go for general eye health screening, responses received from both the female and male groups were similar. Three major factors mentioned by the female respondents (see **Box 3**) include a feeling of pain and discomfort in the eye, spur/encouragement from family and friends and deteriorating eyesight – when they notice their eye is getting worse.

“People don't want to live with eye problems. It is normal for people to go in search of solutions when they are sick, whether it is the eye or anything else. When people are in pain, they look for help automatically.”

“When people do not want the problems with their eyes to get worse, they go in search of help with their problems. Also, some family members or friends can advise one to go to the hospital, if they notice that one is facing problems with their eyes.”

“Because of the discomfort and pain it causes, people will run to get check what the problem with their eyes is. People are curious, anything that is they see or observe, they like to ask 'why'. So, if they have pains or discomfort, they will want someone to tell them why they feel that way.”

Box 3: Extracts from FGD transcripts: females at risk of glaucoma

As shown in **Box 4**, responses from the male cohort revolved around their appreciation of the need for good eyesight and the need to take care of deteriorating eyesight. This is because they believe that their eyes are crucial for their security and wellbeing, social acceptance and ability to engage effectively in economic and religious activities.

“... why people are motivated to seek eye screening exist because if the eye is sick, you can't engage in economic activities, if you rely on people to do things for you, they will get tired of doing so. It is why people quickly seek help with their eye issues with immediacy to protect their livelihood and be of help to others.”

“... for security purpose... if you do not have eyesight, there is nothing you can do, you will be at the mercy of whoever and whatever they want you to do. Then secondly, if what you do for a living involves writing and you lose your sight, that livelihood is lost. For instance, for someone who is a welder or tailor, there is no way he will see the material to cut, so you see, automatically, security-wise even, the fact is that security you can tell what is coming, the fact is the eyes is a person's satellite that gives information that something bad is coming.”

“... and apart from that again, to secure job. Once you do not have good sight... you won't be employed... to secure a job you must have good sight, so people take care of their eyes to be able to get a job...”

“If I am not well, won't I seek medical help? If I am healthy, would I seek help...?”

Box 4: Extracts from FGD transcripts: males at risk of glaucoma

We also enquired from the patients diagnosed with glaucoma to understand how easy it was to attend the initial eye screening before the comprehensive eye check/testing at UATH including the factors that motivated or discouraged them at that time. As shown in **Box 5**, the female patients mentioned that going for eye screening was generally easy. They were motivated by symptoms of eye defects, curiosity to know more about the symptoms felt, knowledge of family members who had eye problems, fear of having serious eye problems, and the opportunity of free medical outreach. However, certain factors discouraged them including friends who downplayed the seriousness of their symptoms, potential cost of screening, fear of potential eye surgery or not knowing anyone in the hospital.

“Attending eye screening was easy. I was motivated because I was curious about why one of my eyes was darker than the other, I could see daylight with one eye and see evening with the other eye at the same time. My friend was discouraging me to go for a check-up, saying there was no pair in parts of my body that is equal, so even if the eyes do not see the same it wasn't an issue.”

“It was easy for me to go for eye screening, though I wasn't given prompt attention. I was motivated to go because I have relatives that have eye problems. When I noticed some defect in my vision, I immediately went to check to avoid having serious eye problems. I got discouraged at first because I could not afford the eye screening then. And the thought that I will not be given attention made me hesitate.”

“It was easy for me because there was a medical outreach in my community, I did not have to go to the hospital. I was motivated by my curiosity as to why I could not read like before. I could only read Islamic writing, but not English. I was discouraged by the possibility of having to do surgery on the eyes.”

“... I was motivated because losing my eyes is like losing every part of my body because the eyes are the light of the body. I was discouraged because if you don't know anybody working in the hospital, they hardly give you attention the first time you go there.”

“I did not want to have eye problems, immediately I observed some faults in my vision, I didn't hesitate to go to the hospital. I was discouraged because I learned about the cost of the screening from a private hospital and I could not afford it.”

“It was easy before because I worked in the hospital. I was prompted to attend the screening because I could not put up with the discomfort in the eyes. I wasn't discouraged at all.”

Box 5: Extracts from FGD transcripts: female patients diagnosed with glaucoma

Similar feedback was received from the male patients (see **Box 6**). For some, going for screening was not easy due to their deteriorating sight, and a few had to go to various hospitals and healthcare centres before their diagnosis was confirmed. Factors that motivated them included their desire to save their failing sight, the emergence of various symptoms, the occasion of free eye screening, the personal habit of routine health checks and encouragement from family members. Distance to the screening centre, especially for people living in surrounding communities, was mentioned as a key demotivator.

“... it was not easy for me to go for eye screening but due to my failing sight, I had to go through it to save it...”

“... I woke up one morning with blurred sight, I took yeast tablets and got some relief. I then went to St. Mary Hospital and was confirmed I had glaucoma; I went to Jos University Teaching Hospital before UATH where after going through some screening was recommended glasses. I then came to UATH the doctor said my eyes were fine but when I told the doctor the diagnosis from the previous hospitals, he asked me to run further testing and it was confirmed that I had glaucoma...”

“... I noticed I had issues driving at night or when it rains and that was what took me to the hospital for further testing. If I am driving and it gets dark, I will have to park and take public transport...”

“... I was not having issues using the eye to read from morning up to noon, but once it is twelve, I find it hard to focus and the eyes becomes teary. I decided to attend a free eye screening here because I also work here and I was referred to Kwaso. It was there I was diagnosed with glaucoma.”

“... I normally come for a routine check-up at the hospital every six months due to my age. It was in one such routine check that I was diagnosed with glaucoma.”

“There is the need to create more screening centres around to make it easy for people to be able to get screened. It is not easy for people especially those living in rural areas to come out here to get screened.”

“As it happened with me when I was diagnosed, glaucoma patients should encourage their relations to also go for screening.”

“There were some signs on way to work that I have the habit of looking at every day, I then realised I couldn't see the signs with my right eye, which gave me concern and I went to the hospital to have my eyes checked. It was then I was diagnosed as having glaucoma.”

Box 6: Extracts from FGD transcripts: male patients diagnosed with glaucoma

Since the community drug distributors (CDDs) are responsible for going into the various communities and mobilising individuals (that meets some specific criteria) to go to the PHC for eye screening, they were also asked to give insights on what motivates their referrals to go to the PHC for eye health screening. Their feedback was based on their experience working in the communities and mobilising people to attend various eye screening programmes (not just for Sightsavers). Responses received (see **Box 7**) ranged from a feeling of pain and discomfort, trust for the guidance of the CDDs, spur from traditional rulers and religious leaders, incentives provided at the screening centres, the range of eye screening services and support provided at the screening centre, time spent before receiving care at the screening centre and people's valuation of their eyesight.

“When people have been suffering from eye problems for long, they are usually motivated to go for screening when they are referred.”

“The people in the community know and trust the CDDs, that also motivates them to attend screening when they are referred by them.”

“When the traditional leaders ask town criers to announce to the community, reinforcing the message of the CDDs, the people are usually encouraged to go for screening.”

“Spiritual leaders play an important role, when they inform their members/followers about the importance of eye health screening, they usually listen to them and go for eye screening.”

“When incentives are given to patients when they go for eye screening, it motivates them and others to go for screening.”

“When patients are attended to promptly at the eye screening centre, they go back and inform others who are then motivated to go. Also, when they get attention for any kind of eye disease they have, not only glaucoma, info spreads in the community and more people turn up.”

“People value their eyes, that alone motivates them to go and check their eyes when they have problems.”

Box 7: Extracts from FGD transcripts: community drug distributors (CDDs)

4.2.2.3. Barriers to the uptake of eye health screening

The same respondents were asked to explain the factors that discourage them and members of their communities from going for eye health screening. Included amongst the major points mentioned by the female respondents are the cost of treatment, less value of eye health, fear of surgery, belief in God's healing, preference for traditional medicine, maltreatment by health care personnel and instances of failed treatments (see **Box 8**).

“Some people don't have money to sponsor their medical health needs. Some have, but it is not enough. Some people have money, but they do not want to go to the hospital. Some it is not because they don't have money, they are miserly that they don't even place importance on their health.”

“People are afraid of eye surgery because most people believe they will lose their sight after the surgery. Especially when they hear that someone went for surgery and did not make it, even if it is not eye surgery, they will be afraid to go for surgery.”

“Some people believe that God will heal every health problem they have. They decide not to go to hospitals at all. They pray every day and go to religious leaders to pray for them also. Some of them get healed.”

“Some people usually prefer traditional and herbal treatment than modern-day hospitals. They believe that the herbs are best for their treatment because some people do not get well even after going to the hospital. Also, mistreatment of patients by hospital staff is a deterrent. They make people feel low of themselves when they relate harshly to them. And when people tell stories of failed treatments, it discourages people from going to hospitals for any reason at all.”

Box 8: Extracts from FGD transcripts: females at risk of glaucoma

As shown in **Box 9**, the male group identified the following factors: ignorance/inadequate knowledge of eye health, inadequate financial capacity to take care of the bills, individual carelessness and negligence, prioritisation of daily economic activities, not receiving care when they come to the health centre and inadequate information and awareness of eye care opportunities.

“We can get like two reasons why, firstly, ignorance. If we do not start having issues with our eyes, we do not go to have them checked. Secondly, others know that if they go for screening, they may have or not have a problem with their eyes but they don’t have the money, how can they go from here to Gwagwalada, how would they get to Kano? If I go to Kano where will get the money to pay my bills? These are some of the reasons they don’t go, they know that there is treatment available, but they can’t access it because of poverty...”

“... sometimes, it is negligence to even go to the hospital to check their eyes, some will tell you they don’t have time... your eyes are having issues and you will say you don’t have time to have them checked... there is someone who was invited and not that he does not have the means to transport himself here but he feels he should use it and buy fish for soup to be made for him. So, for some, it is carelessness and negligence...”

“Another reason why some don’t go to seek eye health is due to the health providers, sometimes you go and they will ignore you, they will not check you, you will wait and they tell you to go home and then they will call you to come again.”

“... you see we can say lack of money plays a greater role in not allowing people to seek for eye health, we can say 75 per cent of the reason even. It is lack of money. Everyone you ask, most of it is money. If I have money, I will not wait on the government to call me for welfare, let us be realistic...!”

“The point is lack of information... awareness... a lot of people would have come to have their eyes checked but because they did not hear, they are not here. Like there are a lot of Fulani people in the bush who did not hear, they will not know. You have a problem but because you don’t have the money and the government has come up with a programme that will assist people but because you are still not aware, how would you come? You will not come. See, like in this issue, if they have met the heads of some of these localities from the beginning, believe you me, this place will not contain us...”

“You see today is my third sitting here, I have been here three times, and nothing happens and that is why some do not come back, that is one. The second is lack of money, the man they brought here and took out is my friend, we have been together for over twenty years. Lack of money led to his blindness. When the thing started, we went up to Kano to some white people’s hospital, not with his money but with money contributed by friends and community. They told him he came to seek help late... you see lack of money can make the eyes go bad, but the government should step in to help on the prices and we will be happy.”

Box 9: Extracts from FGD transcripts: males at risk of glaucoma

Likewise, the CDDs outlined the issues that discourage people from going for eye health screening (see **Box 10**). Key points mentioned include bad experiences faced by others who attended the screening (not seeing a doctor, not receiving care because they have non-glaucoma related issues), cost of transportation to/from the screening centre from their various communities, religious beliefs/faith, ignorance, insignificant improvement after receiving treatment, fear of surgery and absence of incentives at the screening centre. Which ones on this list concur with the community FGDs?

“When people hear about other peoples’ bad experiences in their treatment, they will not want to go for screening.”

“Some people are not able to afford the transport cost to and from their villages and the eye centres.”

“Some people's religious beliefs/faith in God makes them not to go for eye screening for medical attention. They have the belief that God will heal them.”

“A lot of people who did not go to school are ignorant. They prefer traditional herbs than going to hospital for treatment.”

“When people are turned down when they go seeking medical attention when their cases are not glaucoma, they get discouraged. They inform other people of their experiences and that makes others not to go also.”

“When patients are not attended to after several visits to the eye centre they are usually discouraged.”

“When people do not see results from people who have undergone treatment, (from outreaches and sensitisation programmes), they usually do not want to go for screening.”

“Some people are afraid to have to undergo surgery or some kind of treatment, they decide not to even go for the screening.”

“When people attend programmes and go home without incentives, they are discouraged.”

Box 10: Extracts from FGD transcripts: community drug distributors (CDDs)

4.2.2.4. Suggested measures to increase the rate of attendance to eye screening

The respondents were then asked to suggest possible ways to increase the number of persons screening their eyes. Key responses from the female group (see **Box 11**) include the need for health workers to be more caring and accommodating to the patients, use of community youths as agents for community-based sensitisation and awareness creation, and for well-to-do organisations/individuals to organise more free medical programmes in the communities.

“The hospital personnel should change the way they treat patients. It will encourage people to come to them for medical attention and help.”

“Organisations and individuals who have financial resources can volunteer to organise free medical outreaches in communities to check their eyes. It will make people attend eye screening regularly and even other health challenges they have.”

“Community youths should be used to sensitise the communities, because they are educated, and the people will believe and agree to them. Stories of successful treatments should be shared with people, to make them believe that receiving treatment can make them well again.”

Box 11: Extracts from FGD transcripts: females at risk of glaucoma

Similarly, the male group advocated for increased community-based sensitisation and enlightenment championed by the traditional authorities, provision of incentives and free treatments including surgery (see **Box 12**).

“There should be sensitisation, people should be gathered and sensitised about the importance of eye health and the need to go for the eye screening regularly. Like what we did here today, we will go back and tell our family and friends.”

“If the government cares about her people, it should send reminders and information regularly on the importance of eye health.”

“People should be enlightened about eye screening and announcements should be sent regularly through traditional leaders into every community.”

“Treatments and surgeries should be done for free. When people see results from these, they will be motivated to go for screening for their eyes.”

“Incentives should be given to people to motivate them to come for eye screening. The disadvantage of this is that some people who don't have eye problems will go for screening just to collect incentives.”

Box 12: Extracts from FGD transcripts: males at risk of glaucoma

Likewise, the CDDs opinion was sought on ways to increase the number of their referrals visiting the screening centres. Major points made (see **Box 13**) include continuous sensitisation through the traditional leaders, re-training of CDDs to improve their negotiation and persuasion skills, increase in stipends for the CDDs by Sightsavers and expansion of Sightsavers' interest area from glaucoma to other eye diseases like cataract. According to the CDDs, the behaviour changes we seek for glaucoma care can be achieved if similar effort and intensity devoted to immunisation programmes are applied.

“More sensitisation to the people and advocacy visits to traditional leaders about the importance of going for eye screening and the possible dangers of not going. This activity should be continued.”

“Refresher courses should be done for the CDDs, on not just technical skills but also on persuasion skills and other soft skills to be able to work on people's behaviour and responses.”

“... Sightsavers can also deploy more staff in more fields than just glaucoma alone to the eye centres. They should also have permanent staff at the health centres in the community...”

“Eye centres should be provided and established like immunisation centres. Because of how immunisation centres have been established, people don't have to be told about the importance of immunisation...”

“The stipends of the CDDs should be increased to encourage and motivate them the more.”

Box 13: Extracts from FGD transcripts: community drug distributors

4.2.3. Discussion – factors that influence eye health screening seeking behaviour

Analysis of the COM-B survey revealed the key factors that combine to influence eye health screening seeking behaviour of the respondents. Findings showed that motivation is the most influential component and driver, complemented by capability and opportunity in many ways.

All the respondents believe that eye health is important; most believe that screening for eye health is beneficial and want to be proactive in protecting their sight. The majority also reported that they have the physical ability to get to an eye health screening and that they know why they need to go for eye health screening, perhaps because many of them have family and friends diagnosed with an eye disease or defect.

Despite the above assertions, a lot of the respondents stated that they don't think there is anything they can do to protect their eyesight. This viewpoint is supported by the gaps revealed by the study in **knowledge**, **social**, and **cost** domains which combine to serve as barriers to eye health seeking behaviour. In terms of the knowledge element (psychological capability), most of the respondents don't know what the risk factors for glaucoma are or what the disease is; many also mentioned that they neither know when nor where to go for eye health screening. Regarding the social element, we found that most people in the

communities don't go for eye screening and that most families do not have a culture of looking after their eye health.

In terms of cost-related factors, many respondents mentioned that seeking eye health care is not affordable, that they need support to go through an eye health screening process, and that available screening centres are quite distant from their residence.

While some of the studies we examined during the literature review (see references 15 and 16) highlighted as barriers/enablers, findings from the survey disagreed that gender is not a factor, however people with formal education are more likely to go for eye screening than those with little or no formal education.

The qualitative component of the study identified several factors that affected the capability of the respondents from attending the screening centres for eye health screening. In terms of physical capability, the emergence of symptoms of eye defects and deterioration of sight were mentioned as limitations to the individual's ability to visit the screening centres on their own without seeking help.

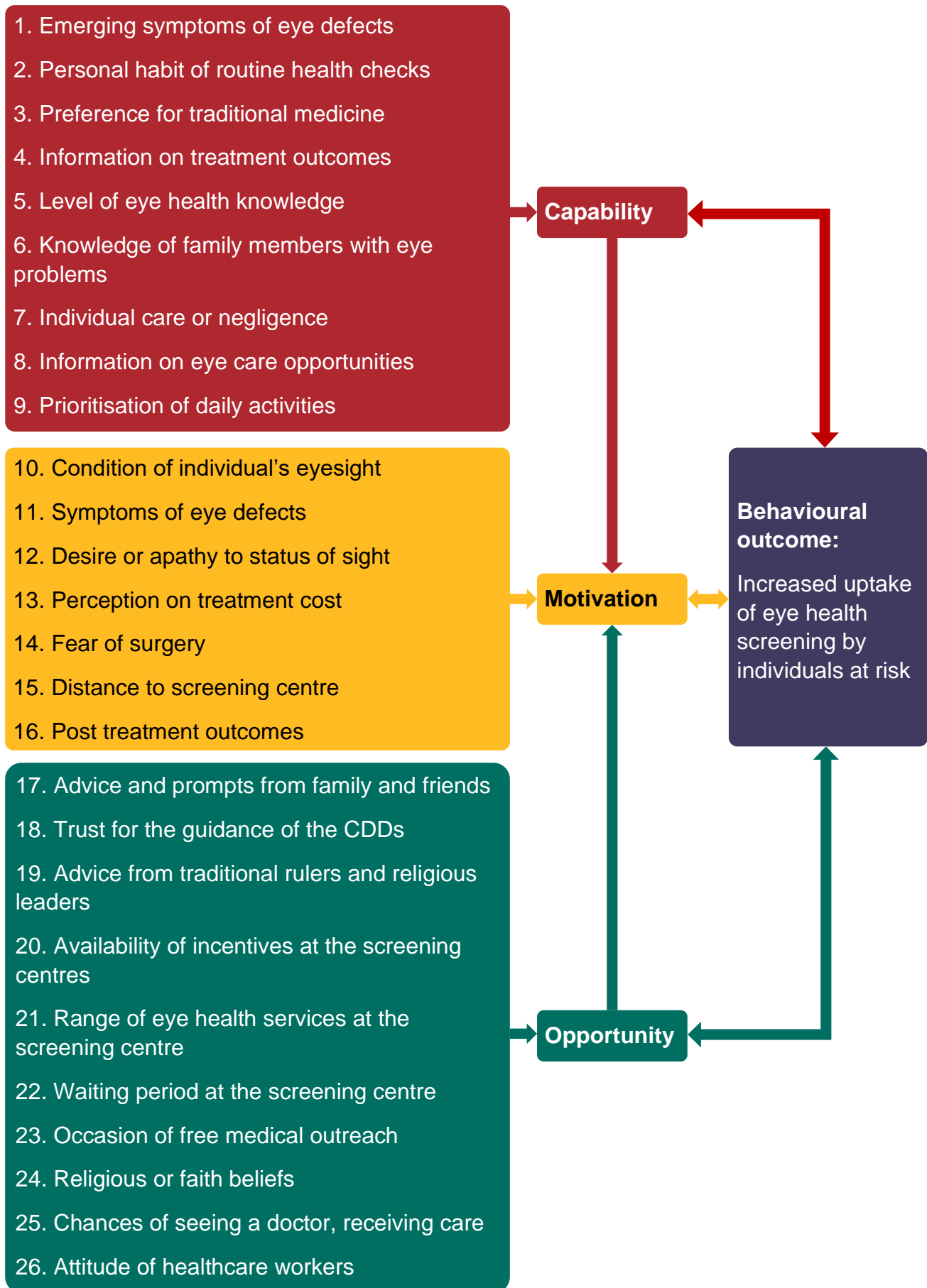


Figure 6: Mapping of findings on Behaviour 1 - uptake of eye health screening using COM-B model

The study also uncovered elements of psychological or mental capability including the personal habit of undergoing routine health checks; preference for traditional medicine; information on treatment outcomes – stories of failed or successful treatments; the level of eye health knowledge; knowledge of family members with eye problems; awareness of eye screening opportunities; and the individual's prioritisation of daily activities – some individuals prefer to pursue their daily economic activities rather than spend time at the screening centre.

Most of the respondents reported **opportunities** or external factors that prompt eye screening attendance behaviour. The majority of these issues are related to circumstances at the screening centres beginning with the availability of incentives – from previous experience of similar programmes organised by other organisations in the PHC, the news of incentives rapidly increases the rate of turnout. The range of eye health services at the screening centre is also another crucial factor – at the moment only glaucoma screening is available and people do not receive any marked attention unless their ailment is suspected to be glaucoma. Such people go back to their communities and discourage others from coming for screening.

The waiting period at the screening centre was reported to be another serious threat. A lot of people wait the whole day before they are seen by the only doctor available. Closely related is that occasionally, due to a variety of reasons, people are not able to see the doctor at all and are asked to come back another day. Other non-screening centre-related influences include the occasions of free medical outreach which are few and far between; deep-rooted religious beliefs – where some individuals believe that they will receive healing through their faith; positive or negative advice and prompts from family and friends; trust for the guidance of the CDDs; and advice from traditional rulers and religious leaders.

Cost of treatment and transportation to the screening centres were also mentioned. Most respondents have limited financial strength and are unable to afford their treatment and, at times, transportation from the various distant communities to the PHC. Typically, when they get information on the amount of money spent by others to receive and maintain treatment, they decide not to show up for screening.

Factors that **motivate** or act as barriers to eye health-seeking behaviour were also ascertained. The key factor mentioned centred around the condition of an individual's eyesight – as symptoms emerge and eyesight deteriorates, the individual's conviction to go for screening increases. This is dangerous, especially for glaucoma, which is regarded as the silent thief of eyesight. By the time symptoms of poor eyesight appear, the damage has already been done. Other motivators include desire or apathy to the status of sight – while some people have a strong desire to save their sight, others ascribe poor sight to old age which they believe is a natural phenomenon and hence should not be treated. More factors include fear of surgery – which they learnt is one of the treatment options; the attitude of healthcare workers; perceived cost of eye care; and post-treatment outcomes – seeing that the eyesight of those receiving treatment does not improve further discourages them from seeking eye care themselves.

4.3. Attending hospital eye testing centres

4.3.1. Focus group discussion responses

4.3.1.1. Experience during comprehensive eye testing at UATH

Patients diagnosed with glaucoma spoke to us about their experience attending comprehensive eye testing at UATH, including the motivating and discouraging factors leading up to their visit to UATH. As described in **Box 14**, many of the female respondents stated they had no issues attending the testing aside from the fact that it was more expensive than the screening, and the process itself was difficult. Motivating factors centred on their resolve to restore their eyesight to normalcy and prevent possible blindness. However, cost of treatment and the fear that treatment may not yield significant results discouraged some of them.

“It was easy for me... I was willing to go through anything to have my sight... I wasn't discouraged at all.”

“It was a bit difficult to attend the comprehensive test because it was more expensive than the screening. The process itself gave me a hard time... I wanted to take the test anyway because I didn't want the problem to escalate.”

“... health is wealth, I want my eyes to be healthy, so I didn't hesitate to take the test.”

“... though the process was straining, I wanted to read as I did before so that motivated me to attend the test. I did not face any discouragement.”

“... I learned that glaucoma could make me blind, so I rushed to take the test so I can be treated. I was almost discouraged by the fear that even after the treatment, my eyes will never go back to be the same.”

“... at the screening, I was informed that the problem with my eye was very serious so that motivated me to go and take the test. What almost discouraged me was the fact that the problem may still be there even after the treatment.”

“It was easy for me. The cost of the test discouraged me, but the doctor encouraged me to take the test.”

Box 14: Extracts from FGD transcripts: female patients diagnosed with glaucoma

Male patients also provided analogous responses (see **Box 15**). Fear of blindness and limited activities due to poor sight were the major motivating factors. Long waiting queues at the hospital also made the experience of eye testing unpleasant.

“The fear of going blind from the glaucoma was the major motivation for me even though it was not easy due to the crowd that attends here and the few workers they have here too made it cumbersome, the waiting time is long and slow.”

“I found it truly disturbing the thought that I could go blind if I don’t take action, so it was not a big issue for me to seek help.”

“I was finding it difficult driving once it gets dark as I can’t see or when it rains, it was a serious concern for me, so I had to keep looking for help to correct that.”

Box 15: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.3.1.2. Factors that enable the uptake of comprehensive eye testing

When asked about what motivated them to proceed to UATH for the comprehensive eye examination (after the initial screening), female respondents highlighted the following factors (see **Box 16**): awareness of the effect of untreated glaucoma, perceived competence of healthcare workers in UATH, the value placed on their eyesight, the emergence of symptoms and closeness of residence to UATH.

“When people know other persons who were diagnosed with glaucoma and are aware of how much damage it can cause to the sight, they’re motivated to attend comprehensive eye testing. Also, some hospitals are considered more competent and standardised than others, when that is the case, people do not hesitate to go to where they get better results for their health.”

“When eye centres are close to people’s place of residence, they are easily motivated to attend the tests.”

“People generally value their eyesight; it is normal to go in search of solutions for the problems once the symptoms are showing up.”

Box 16: Extracts from FGD transcripts: female patients diagnosed with glaucoma

For male patients, major enablers include the strength of enlightenment received during the screening, desire to prevent blindness and the positive reputation of UATH in matters of eye care (see **Box 17**).

“The number one motivation is the need to prevent the issue from going worse than it is as they were enlightened on what the implication of leaving it untreated could lead to their going blind.”

“Once you are screened and you are told that there is a need for more testing, you will want to go and get tested so that you can get help with the issue.”

“There is the belief that the best professionals on eye care work here at the UATH. As such, people come here with the belief that their issues will be resolve as the best care is available here.”

Box 17: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.3.1.3. Barriers to the uptake of comprehensive eye testing

As shown in **Boxes 18 and 19**, barriers to uptake of testing are chiefly the prohibitive cost of the comprehensive eye examination, maltreatment by health workers, distance to UATH from people’s locations of residence, the inability of the hospitals to attend to all patients daily, a preference for traditional herbs and religious/faith-based beliefs.

“The cost of the comprehensive test, many people are not able to afford it. Also, the mistreatment of some hospital personnel makes it difficult for patients to further their treatment.”

“The distance of the eye centres from the community of residence. When these centres are far, people are not always motivated to carry on with their tests.”

“Hospital policy and rules are not so favourable to patients, sometimes you come to the hospital and they tell you they have a specific number of patients they attend to daily, so they can't attend to you.”

“Traditional beliefs... some people will rather take herbs for cure than modern medicine.”

“Religious beliefs... some people believe that their faith will heal them, so there's no need to even go and find out what is wrong with their eyes.”

Box 18: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“There is a need for improvement in the service delivery here at UATH as it usually takes almost the whole day to get to see a doctor and then they close early due to lack of staff to take shifts. So, it is not funny that you come here, and they are in a hurry to dismiss you just so that they can attend to the others without taking time to do a proper check. They need to employ more hands to ease the work of the doctors here.”

Box 19: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.3.1.4. Suggested measures to increase the rate of attendance to eye testing

Regarding ways to ensure that more people show up for comprehensive eye examination, feedback from the female respondents (see **Box 20**) include the following: sensitisation and awareness creation focusing on associated risks of ignoring the tests; reinforcement of the need to go for testing by the doctors when they refer people to UATH after conducting eye screening; and organising free eye testing outreaches in the communities – this induces a peer pressure effect since most people will be encouraged by others going to test their eyes.

“People should be sensitised about the risks of not going for tests. The doctors should tell the patients when referring them for a test. When they tell them about the problems with their eyes when they don't feel much pain or discomfort, they also can tell their relatives or friends and family to go and check their no matter how little the pain or discomfort is.”

“Programmes should be organised for free comprehensive testing in communities. When programmes and interventions are organised in communities, people will go because they see other people going. People will also go because it is close to where they are staying.”

Box 20: Extracts from FGD transcripts: female patients diagnosed with glaucoma

Similar responses were received from the male cohort (see **Box 21**). The main points raised include massive awareness creation focusing on the importance of early detection and free screening and treatment.

“There should be mass enlightenment on the dangers associated with glaucoma and its late detection to encourage people to go for regular eye screening and testing.”

“One way to motivate people to go for screening and testing is to make the treatment for glaucoma free to encourage the poor to go for early screening as knowing it won’t cost them will encourage them to do so. The cost of buying drugs for this condition will discourage a lot of people from seeking medical attention.”

“The doctor that diagnosed me asked me to come with all my family members for them to be screened too. I think the government needs to push out messages that will scare people into going for eye screening to help reduce the risk of going blind due to late detection of this condition.”

Box 21: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.3.2. Discussion – factors that influence eye testing seeking behaviour

Results here are closely related to the factors that influence attendance to eye health screening. Those classified under **capability** include the individual’s ability to engage in usual daily activities; knowledge of the effect of untreated glaucoma; individual appreciation of good eyesight; the emergence of symptoms; and a resolve to restore their eyesight to normalcy. Despite being told that at the screening centre they may have glaucoma (and getting a referral to UATH for a comprehensive eye check), many fail to visit UATH as referred until their sight further deteriorates and they are no longer able to carry out their usual daily activities. As mentioned earlier, some of the patients who are on their own are unable to go to UATH without someone leading them.

Regarding **opportunity**, the study identified proximity of individual’s residence to UATH – closely related to individual financial strength; perceived competence of UATH in eye care delivery – UATH is renowned as the best public facility for eye care in the region; and quality of enlightenment and persuasion received during the screening as the most crucial elements that determine the uptake of comprehensive eye examination for those referred from the screening centres. Others include the attitude of healthcare workers, chances of seeing a doctor at UATH, preference for traditional herbs, and religious/faith-based beliefs.

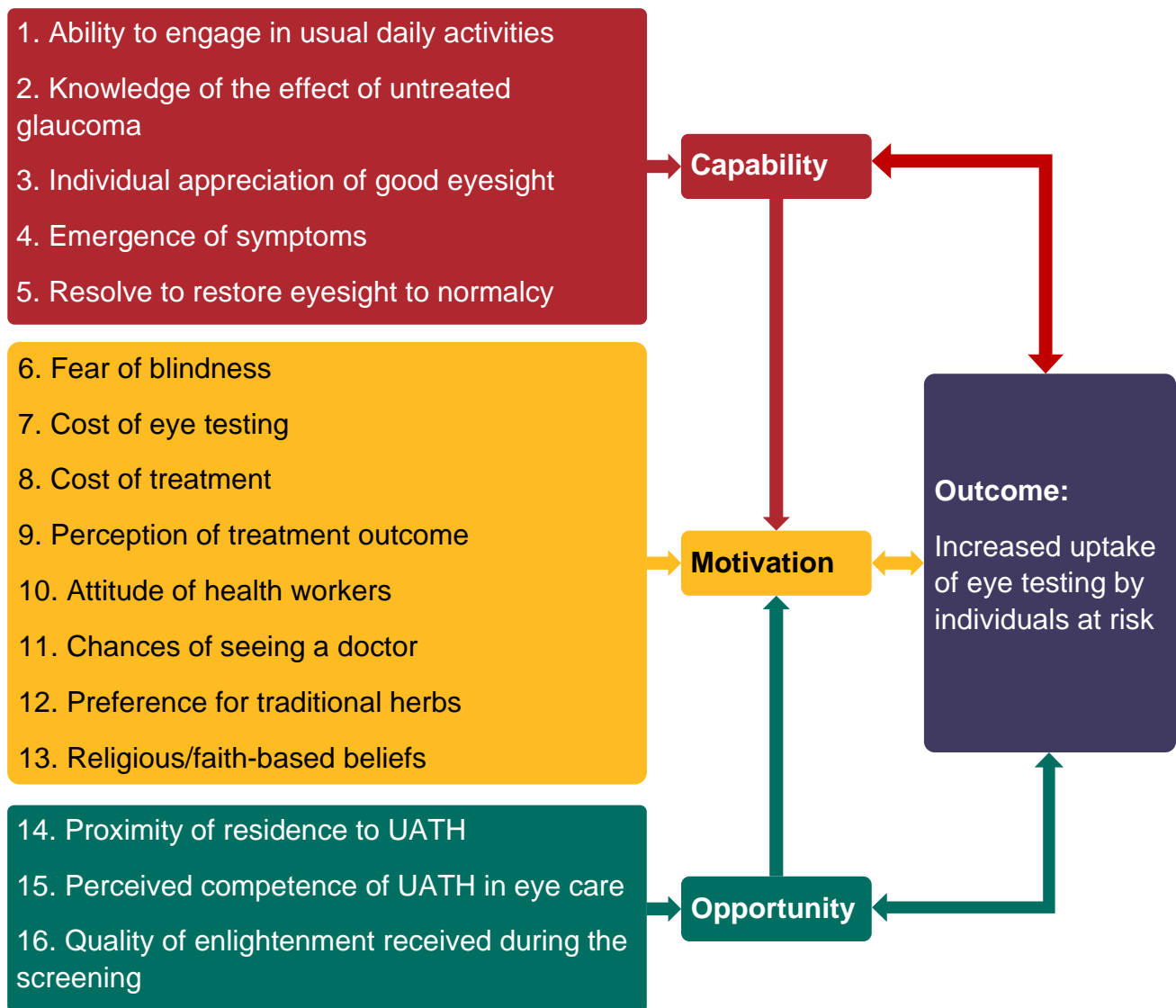


Figure 7: Mapping of findings on Behaviour 2 - uptake of comprehensive eye testing using COM-B model

In terms of **motivation**, some other factors were uncovered as critical influencers to the ability of the respondents to take the next step and visit UATH for the eye test. These include fear of blindness, cost of eye testing, cost of treatment and perception of treatment outcome. Of note is the additional layer of cost of testing at the hospital: individuals often weigh up the potential financial outlay involved in seeking and maintaining care alongside the benefits.

Many people are aware that treatment for glaucoma does not restore their eyesight to normalcy, hence they are not readily convinced of the need to commit meagre resources to the process.

4.4. Attending regular follow-up appointments

4.4.1. Focus group discussion responses

4.4.1.1. Experience in attending follow-up appointments at UATH

Motivated by the desire to maintain good eye health, most of the respondents expressed that they were comfortable attending their follow-up appointments at UATH (see **Boxes 22 and 23**). The appointments are easily rescheduled whenever they miss one, although one of the female patients complained of an occasional issue of missing hospital case files.

“I wasn't discouraged at all, and the fact that I worked in the hospital made it easier for me to attend the appointments.”

“I saw it as a necessity, so I would not say it is easy or difficult, nothing discouraged me.”

“I find it easy to attend follow-up appointments. Even if I miss any appointments, the doctor usually reschedules for me and I do not miss it.”

“Attending follow-up appointments is easy because the doctor attending to me is usually caring and they encourage me to come for my appointments. What discourages me is that sometimes I come to the hospital and my file is missing. I have to keep going through another process before I see the doctor, or they give me a temporary card...”

“Attending follow up is easy for me, my motivation for doing this regularly is my desire to get well completely.”

“It easy for me. I am motivated by someone's story. He got blind because he did not attend his follow-up appointments. Since I learned about that, I religiously attend my appointments.”

Box 22: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“It is easy following up because you know you are dealing with the very best in that field and they have the experience to handle the case efficiently.”

“I have been attending this hospital and never missed an appointment. One time I travelled and missed an appointment, a lady here talked rudely to me and told me she can misplace my file and make it difficult for me to access my services here and for two years, they couldn't find my file and they had to open a temporary one for me. I then told one man after all the years and in less than thirty minutes he brought out my missing file. This kind of thing can discourage one from attending to his appointment.”

Box 23: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.4.1.2. Factors that enable attendance to follow-up appointments

Motivating factors for both respondent cohorts (see **Boxes 24 and 25**) include testimonies of those receiving treatment, awareness of the consequence of neglecting their appointments, desire to prevent blindness, health campaigns by religious organisations, encouragement by the doctors, lack of knowledge of alternative hospitals for treatment and the comparatively lower cost than private hospitals.

“When people hear about successful treatments from others, they are motivated to go because they believe they can also be treated and get well. They will even want to go to the same hospitals and be treated by the same doctor(s)...”

“When people are aware of what glaucoma can do to their sight, they will not neglect follow-up appointments, but if people don't know the risks and dangers, they will take it with levity. Also, some religious organisations hold health seminars to teach about good health practices which include following up on appointments. When people are encouraged in religious settings to go for hospital appointments, they will take it seriously.”

Box 24: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“The desire to find a solution to the problem makes it easy to follow up because you don't want to go blind from the disease.”

“When someone testifies that yes, this is where I was cured. Many people will be encouraged to go there...”

“I keep going because one of the doctors here encouraged me. The way he spoke to me and educated me is one of those things that motivated me...”

“Some people may not know of other private hospitals where they can receive immediate treatment... the only solution is to continue coming here and be getting checked up... those that know also weigh the cost here which is lower than going to private where he thinks they can give him immediate attention...”

“The reason I keep going back is because of my illness because the eye is not something you can play with, so that is why I keep going whenever my appointment reaches...”

Box 25: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.4.1.3. Barriers to attending follow-up appointments

The respondents also spoke about the issues constraining patients from attending follow-up appointments. As shown in **Boxes 26 and 27**, factors mentioned include the cost of treatment, the possibility of not being attended to (inadequate staffing at UATH), poor behaviour of some healthcare workers, tracing of hospital case records/files, being attended to by student doctors, length of time spent at UATH, absence of drugs at UATH, and demotivation from a lack of significant improvement on their sight.

“The cost of some treatments discourages people from following up on their appointments. When they are not able to afford the treatment, they usually will not come for appointments, since they did not take the treatment as prescribed by the doctor. Because it will be like a waste of time. If you do not use the treatment the doctor asked you to, what do you expect the doctor to check when you come?”

“Sometimes when people go for their appointments, they usually do not get prompt attention. It makes them hesitate because they do not know if they will be given attention or not. Instead of going for appointments that one is not sure attention will be given, one would rather go about their everyday business.”

“At times, the way record officers treat patients and even insult them, makes them feel less of being human. It discourages patients a lot. Some people are even afraid to approach some of the workers when they need help because they might be insulted or shouted at...”

Box 26: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“The cost of treatment here is too high. My sister who also is treating glaucoma in the University of Calabar Teaching Hospital told me she only needed her transport fare and money for accommodation and every other thing is done free for her but here you pay for everything. They will say you will be operated on and the cost of operating one eye is eighty thousand naira and it is still a 50-50 chance of it been successful.”

“There is the case of missing files like I narrated earlier too which is rampant at this hospital, it does discourage one from coming to access treatment here too knowing that it is done deliberately to frustrate you.”

“There is the challenge of inadequate staffing which makes it tiring having to wait for so long to be attended to when one comes here for his appointment. They have the rush to see patients because of their closing time.”

“... since I started coming here, no experienced doctor has attended to me, it is only student doctors. Only recently a lady doctor showed up and is consistent with me and she was the one that was encouraging and giving some word which gave me the hope to remain there...”

“... at times they don't [have] the whole equipment here, you have to go to other hospitals to do some tests etc... and bring back the result...”

“... lack of positive outcome or improvement is discouraging... you continue to spend money on transportation, on medications without seeing positive response... yes one will be discouraged, it is a source of frustration...”

“... the actions of the health workers can discourage somebody... most of the nurses don't attend to patients there in a cordial way, so they just flare up at the slightest provocation, you know somebody who is a new person there, you just get there and see how they will be talking to you as if you are just their servant or their slave.”

“Anytime you come you will meet a crowd and the time spent there is a lot, it's not easy. If you go there around 8am, before the doctors will come and attend to you and you leave, it will be around 12pm to 1pm.”

“Absence of drugs in UATH increases our cost and discourages us from coming for our appointments... during COVID-19 period... the cost of the drugs was very high, drugs I get from the hospital at #3,500 was sold for #7,500 outside...at times if you go they will tell you they don't have it.”

Box 27: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.4.1.4. Suggested measures to increase the rate of attendance to hospital appointments

In terms of ways to increase the number of patients visiting UATH for their follow-on appointments, the respondents made the following suggestions (see **Boxes 28 and 29**): use of multimedia for community-based sensitisation on the effect of untreated glaucoma; staffing of UATH to ensure that patients are adequately catered for; stocking of relevant drugs in UATH pharmacy; and provision of incentives for those who adhere to their appointments.

“Education and sensitisation in the community about the dangers of neglecting treatment so that people are aware of the risks because some people don't know. They think doctors just want them to be coming to the hospital and spending money, whereas it is for their wellbeing.”

“The doctors should also always inform the patients very well about the dangers of not following up on their appointments. For instance, she was not well informed about glaucoma until after her surgery and she wished she did not take the surgery. The government should also sensitise the public on general health practices on radio, TV and on billboards.”

“Incentives should be given to patients as they consistently come for their follow-up appointment. When people come and you give them something today, if you ask them to come again, they will come.”

Box 28: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“There is need to get new equipment for carrying out tests here as the cost of going to private hospitals which they usually refer us for some test is expensive and that discourages people from going through with eye health care.”

“More staff should be employed to reduce the wait time and extend work hours at the department because staff usually close early and that makes them rush the patients without giving close attention to patients.”

“The hospital authorities should stock enough drugs in their pharmacy so that we can always buy at a cheaper rate.”

Box 29: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.4.2. Discussion – factors that influence attendance to follow-on medical appointments

The study found determinants of attendance to follow-up appointments amongst patients diagnosed with glaucoma. All respondents believed that without visiting the UATH for regular checks, their eyesight may become worse and they may go blind (**perceived susceptibility and severity**). Considered as **perceived benefits** include the fact that treatment in UATH is cheaper than in private hospitals and that their vision will be maintained if they remain consistent with regular follow-up checks.

Several factors were also identified as **barriers** to attendance to regular appointments. They include: treatment cost; the possibility of not seeing a doctor (or an experienced doctor) due to inadequate staffing at UATH; unprofessional conduct of some health workers; occurrences of missing hospital case records/files; length of time spent at UATH; absence of drugs at UATH; and demotivation from lack of significant improvement in their sight. The high cost of treatment appears to be the greatest barrier as it prevents them from purchasing and applying their medication. Knowing that the doctors will ask them about adherence to their treatment, most of the respondents opt not to visit the hospital entirely.

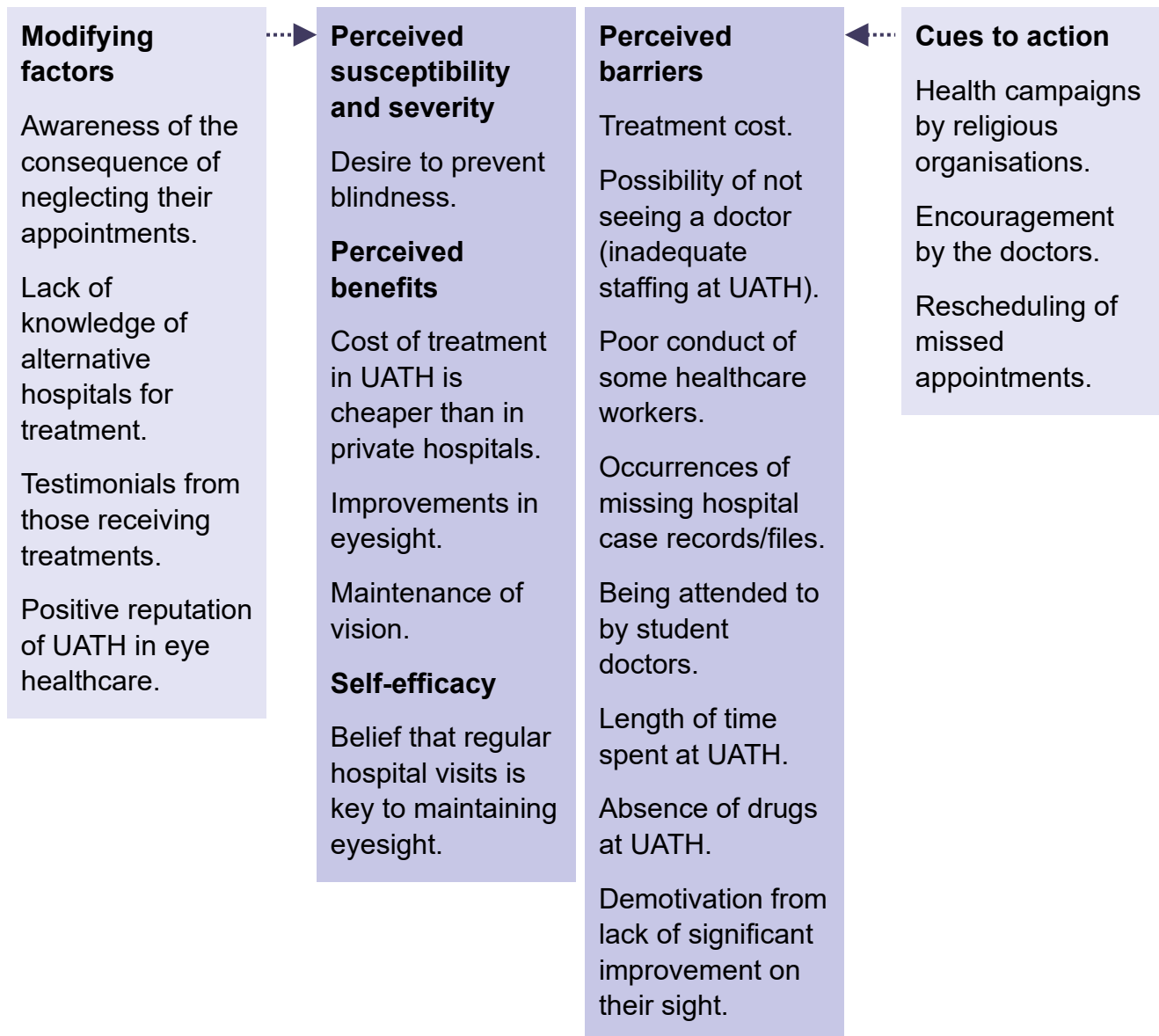


Figure 8: Mapping of findings on Behaviour 3 – attendance to follow-on medical appointments, using HBM

While occasions of health campaigns organised by various NGOs and religious organisations, encouragement by doctors and the opportunity of rescheduling of missed appointments serve as triggers or **cues for action**, awareness of the consequence of neglecting their appointments, lack of knowledge of alternative hospitals for treatment, testimonials from those receiving treatments and the positive reputation of UATH in eye healthcare influence the behaviour as **modifying factors**.

4.5. Adhering to medical treatment

4.5.1. Focus group discussion responses

4.5.1.1. Experience with eye surgery at UATH

Only one female respondent confirmed that she underwent surgery. According to her (see **Box 30**), she agreed to undergo surgery to avoid taking medication for life. However, the surgery on the first eye was repeated and did not meet her expectation, hence she opted out of surgery for the second eye.

“It was a very difficult experience for me undergoing surgery. The surgery was not successful, the doctors had to work on the eye again because cotton wool was left in the eye and the stitch was still there. I was motivated to do surgery on the first eye because I was informed that if I do not do surgery, I will take drugs for life. I did not want to use drugs every day for life, so I opted for the surgery. I was discouraged to do the second surgery on my other eye because the first surgery failed. I still could not see like before, and there was no difference. So, I was discouraged to do another surgery.”

One male respondent, in contrast, disagreed with the option of having surgery. In his opinion, he was not fully convinced of the benefits since a full recovery of vision was not guaranteed after surgery.

Box 30: Extracts from FGD transcripts: female patient diagnosed with glaucoma

“I was never given the option of surgery since I started treatment for glaucoma and I won't even take it if offered. I heard that there is always a 50-50 chance of success with surgery, is that true?”

“They said surgery is 50-50 and me I don't want to lose my eyes, so I decided to be taking drugs.”

“... from the beginning, I was told that laser surgery is better than manual surgery... I asked where I can get the laser surgery and they mentioned Kano... they also said it is expensive although they didn't tell me the cost...”

Box 31: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.5.1.2. Experience with application of eye drops

Most of the respondents agree that the process of applying eye drops was easy for them, although sometimes they forgot to apply the drops (see **Boxes 32 and 33**). However, a few factors discourage them including pain felt after the application, unavailability of specific drops at pharmacies, and unaffordability of the eye drops and wastage during the application

- especially for those who can't see clearly with one eye and who can't get help from family members or children.

“Administering the eye drops is easy for me... sometimes I forget, but to apply it is easy... what discourages me is that the eye drops prescribed are not easily found in the drug store.”

“Applying the eye drops is usually a difficulty for me because I can hardly see with one of my eyes. I am not able to apply it in and my kids do not know how to apply it for me either, they keep wasting it.”

“Applying the eye drops is easy but they always hurt when applied. Sometimes the pain discourages me from applying it. And I forget sometimes.”

“I find it easy to apply the eye drops. I am discouraged sometimes by the cost of the prescriptions. I am not always able to afford the eye drops.”

Box 32: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“It is not easy administering the eye drops by myself as I end up wasting it due to the failing eyesight.”

“I have to set my alarm on my phone to remind me when to use my drops as I tend to easily forget when to apply it...”

“... that one is easy for me because I put in the morning and the evening because they gave me a time, 7am and 8pm.”

Box 33: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.5.1.3. Factors that enable adherence to medical treatment

According to both male and female patients (**Boxes 34 and 35**) and in addition to a few mentioned above, factors that motivate adherence to treatment regimen (surgery) are mostly fear of blindness, and fear of dependence on eye drops and other drugs for life. For eye drops, the perception that eye drops are potent and result in improved eyesight contribute to adherence. For both treatment options, the availability of financial resources is crucial.

“People opt for surgeries because they are afraid of going blind. They are told if they do not undergo surgery, they would go blind sooner or later.”

“Fear of dependence on drugs. Some people are informed that if they undergo surgery, they will not have to use drugs throughout their life, so they decide to undergo surgery. For eye drops, some people are motivated to use them to stop their eye problems from getting worse if the problems are still mild.”

“Eye drops are usually effective, so people adhere to the treatment since they know it can make them better.”

Box 34: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“The need to recover one’s eyesight is the strongest motivation for adherence to the treatment regime... if you didn’t put your eye drop and you come for a check up, they will tell you that your pressure is very high which will not sound well...”

“Visible results from treatment motivates one from continuing using their medication.”

“Ability to finance treatment is also one of the factors... when you have the resources to continue, you cannot relax. But when there are no resources, you will say what will I do?”

Box 35: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.5.1.4. Barriers to adherence to medical treatment

The female respondents were also asked to talk about the issues that contribute to non-adherence to medical treatment, be it uptake of surgery or consistent use of eye drops as prescribed by the doctors (see **Box 36**). Regarding surgery, the main factors identified include perceptions that blindness comes with age (hence no need to undergo surgery if you are already ageing), fear of surgery especially for those who are aged and those with poor health conditions, cost of surgery which is often beyond the reach of most individuals, bad personal experiences shared by those who already underwent surgery, and the fact that surgery is not known to significantly improve eyesight for glaucoma patients.

In terms of the application of eye drops, common barriers to adherence include forgetfulness or difficulty in remembering to apply the drops every day (also related to treatment longevity as the eye drops are often prescribed for life), unavailability of specific eye drops prescribed at the drug stores, cost of purchasing the eye drops and perceived ineffectiveness of some of the eye drops.

According to male respondents, several factors make it difficult for patients diagnosed with glaucoma to adhere to their prescribed treatment. These include the persistent non-availability of the drugs at UATH pharmacy, occasional non-availability of eye drops at other

drug stores, the high cost of the drugs, conflicting personal schedule, and lack of significant improvement from the treatment (see **Box 37**).

Surgeries

“... old age... some people do not like to take surgery because they think that they might die and may lose their life during the surgery... some think that if they get blind, it is something that comes with old age.”

“Health conditions. People with poor health conditions fear that undergoing surgery will worsen their poor health.”

“The financial cost of the surgery is a huge discouragement because not many people can afford it.”

“Personal experiences of people who have undergone failed surgeries. When stories are told of cases that worsen or remain the same after the surgery, people will not want to go through all that again.”

Eye drops

“Many people are forgetful. It is not easy to remember every day the time one ought to apply the eye drops.”

“The unavailability of the eye drops at drug stores... ineffectiveness of some prescriptions... sometimes the eye drops are ineffective, they don't work. People keep using them but there is no indication of getting better.”

“People's experiences of not seeing results after using eye drops can also discourage people from adhering to their treatment.”

“... financial constraints, when the eye drops needed to be bought to continue treatment, some people can't always afford to buy them. It hinders them from adhering to treatment.”

Box 36: Extracts from FGD transcripts: female patients diagnosed with glaucoma

Eye drops

“... every time you come here the doctors will write a prescription for you to go to the pharmacy, but they will always say that the drugs are finished. You go out to buy at very exorbitant prices. They have to do something about that... why will the doctors keep directing people to go to the pharmacy if they know there are no drugs?”

“The cost of getting drugs is one thing that discourages adherence to treatment as it is not easy for many to buy the drugs consistently.”

“... if you do not have someone helping you with administering the drugs, you end up wasting a lot when you apply it yourself due to the failing sight...”

“The drugs are not ever available at the pharmacy which would have been a lot cheaper than it is outside and even outside, it is not everywhere you get the drugs to buy.”

“The eye drop is very costly. Some of us that are under NHIS have never gotten the drugs in this hospital... and if you go outside is around 4500.”

“... another reason is when the drug is not effective, they have to abandon it and maybe go for local herbs. Like one man told us that there is a local herb he has somewhere, you know, at a time I interviewed him the more, I discovered that he is even using the local herb as if he is using the drug (laughs).”

“At times, I skip the drugs because of one appointment or the other... I was told I should apply it 7 to 7, you know, maintain a certain time. I try to maintain that, but you know human nature is there. Sometimes I may move out and miss the time.”

Box 37: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.5.1.5. Suggested measures to increase the rate of adherence to medical treatment

Like previous recommendations, the respondents proposed increased awareness by the hospitals, government and non-governmental organisations on the dangers of skipping treatment protocols (see **Boxes 38 and 39**). Subsidy on drugs was also advocated. Working towards an improved doctor-patient relationship was also mentioned as crucial.

“Health organisations should get volunteers to educate people in the community about the importance of adhering to treatment and the risks that exist when they don't adhere. The government should sensitise the public on general health matters including adherence to medical treatment through the radio.”

Box 38: Extracts from FGD transcripts: female patients diagnosed with glaucoma

“Let the government subsidise the drugs for us... when the drug is available at a cheaper rate, they will be able to afford it and apply it.”

“... contact with your doctor, your medical officer is very important. If the doctors themselves can make it a point of duty to reach out to their patients through a certain forum and discuss with them to find out how they are faring... that will encourage the patient.”

“... some of the non-governmental organisations used to give free eye google, eye drops and some tablets... or they used to charge us less money.”

Box 39: Extracts from FGD transcripts: male patients diagnosed with glaucoma

4.5.2. Discussion – factors that influence adherence to treatment regimen

Fear of blindness and fear of dependence on medications for life were identified as two main factors that portray the respondents' **perceived susceptibility and severity** of glaucoma. In terms of **perceived benefits**, the respondents highlighted both improvements in eyesight and maintenance of vision.

Similar to Behaviour 3, a lot of **perceived barriers** were identified including perceptions that blindness comes with age; fear of surgery; the cost of treatment - surgery, eye drops; information on negative outcomes from surgery; knowledge that treatment does not restore vision, forgetfulness in applying eye drops daily; and treatment longevity. Other barriers include unavailability of specific eye drops prescribed at the drug stores; perceived ineffectiveness of some of the eye drops; persistent non-availability of the drugs at UATH pharmacy; occasional non-availability of eye drops at other drug stores; high cost of medications; and pain/discomfort felt after applying eye drops.

The respondents' personal belief and confidence that they can adhere to their treatment regimen (**self-efficacy**) is influenced by conflicting personal schedules, personal experience with surgery and stories of failed surgeries. Help from family members in applying eye drops (to avoid wastage) and the use of phone alarms as reminders all serve as **cues for action**. Other factors (**modifying factors**) that influence adherence include awareness of the consequence of non-adherence; testimonials from those receiving treatments; the potency of prescribed eye drops; and individual financial strength. See **Figure 9**.

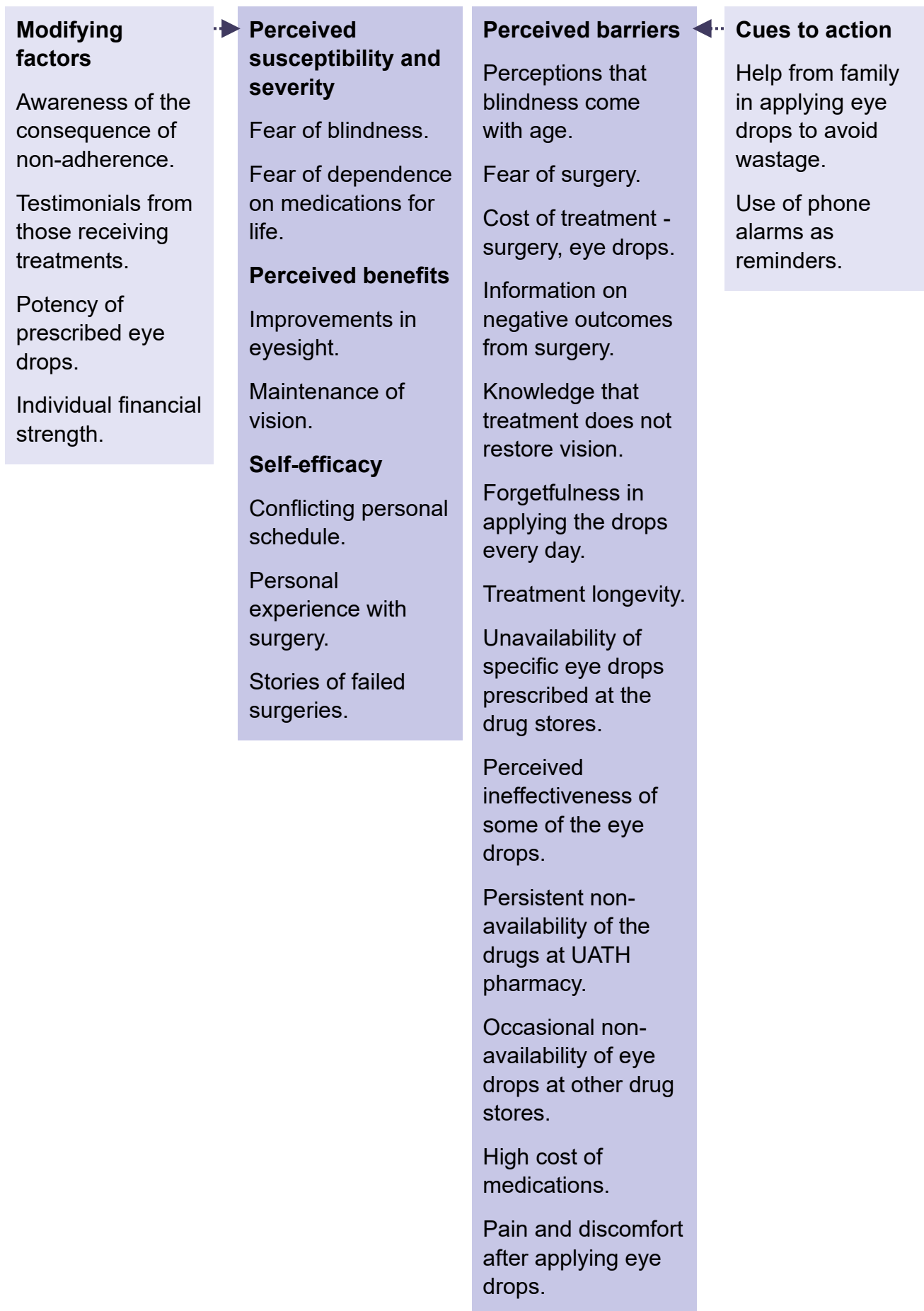


Figure 9: Mapping of findings on Behaviour 4 – adherence to treatment using HBM

4.6. Communication preferences

4.6.1. Communication channels and sources

All the respondents (individuals at risk of glaucoma and patients diagnosed with glaucoma – both adherent and non-adherent cohorts) were asked about their preferred communications sources and channels/medium for health-related information and messages.

Amongst the individuals at risk, their trusted communications sources include town criers (11 votes), traditional leaders (nine votes) and religious leaders (nine votes). Town criers were voted as their most trusted source because they believe that messages passed by the town criers were screened and sanctioned by the traditional leaders.

When asked about preferred channels, radio was mentioned and voted for by five people. Most of them declared that they do not own a TV set, while others mentioned that they rarely watch TV due to the erratic power situation in their communities. SMS was also mentioned, especially if sent by trusted people like family members.

For patients diagnosed with glaucoma, trusted communication channels include SMS (10 votes), TV (10 votes), announcements in worship centres (10 votes), phone calls (seven votes), word of mouth (six votes) and radio (five votes). Less preferred or trusted media include social media (three votes), newspapers (one vote) and handbills (one vote).

Regarding choice sources, most of the respondents are happy with information received from healthcare workers (six votes) and community folk undergoing treatment on the same health challenges they are facing (six votes). Most people voted radio and TV as a trusted source because they said they have found most of the health information they get from both platforms are true. SMS is also favoured by most because they can always reference it and show it to other people, including their doctors.

Those who opted for phone calls mentioned that they are unable to read text messages or prints or even watch TV due to their poor sight, also they can ask questions over the phone and get immediate feedback. Word of mouth was also considered a trusted option especially when they receive the same information from many people in the community - this is also related to information received from those who have the same problems/experience with the health challenges they are facing.

Social media was mentioned by a few people because they received useful information about COVID-19 on social media before any other channel. Newspapers were mentioned but was not regarded as a trusted source by most of the respondents as they believe the information there is usually exaggerated.

4.6.2. Ownership of smartphones

Only one male amongst the 20 individuals at risk of glaucoma uses a smartphone. Of the 20 patients diagnosed with glaucoma, 13 use smartphones (10 males, three females).

4.6.3. Favourite advertorials

When asked to recall their favourite advertorials (including jingles, flyers, TV/radio commercials) in any topic, the female respondents mentioned mostly TV/radio commercials for products like food seasoning products such as 'Royco', 'Star' and 'Ajinomoto'. They also

recalled commercials by telecommunications companies like 'Airtel'; food and beverage company products like 'Minimie' snacks and 'Coca-Cola'; and other popular radio jingles aired on 'Berekete' family radio and 'Wazobia' radio.

According to the respondents, these advertorials easily come to mind because of the songs used, the voiceovers and the drama acted in them. They were able to relate to the drama because it portrays what most women usually do in their households. The songs were funny, had catchy phrases, and they could easily dance to them.

5. Summary, conclusions and recommendations

5.1. Summary of key insights

While the study revealed a catalogue of enablers and barriers to each of the four behaviours of interest discussed in the preceding sections, the most significant enablers and barriers are highlighted in **Tables 5 and 6** respectively. In prioritising the key insights (see **Annexe 2**), related factors identified by the respondents (see **Figures 6, 7, 8, and 9** above) were merged into broader themes. Also included in the priority list were key barriers identified from the COM-B survey analysis. From this selection, factors that influence multiple behaviours were shortlisted.

Table 5: Mapping of most significant enablers to behaviour change

Key behaviour influencers – enablers	Behaviour 1: attending eye-health screening	Behaviour 2: attending comprehensive eye testing	Behaviour 3: attending follow-on medical appointment	Behaviour 4: uptaking and adhering to treatment	
				Surgery	Eye drops
Desire to prevent blindness					
Intensity and severity of symptoms					

Key behaviour influencers – enablers	Behaviour 1: attending eye-health screening	Behaviour 2: attending comprehensive eye testing	Behaviour 3: attending follow-on medical appointment	Behaviour 4: uptaking and adhering to treatment	
				Surgery	Eye drops
Quality of counselling received from doctors					
Social elements (advice/help from family/friends, CDDs, traditional and religious authorities)					
Fear of surgery					
Preference for a one-off treatment					

Colour coding: The different shades above show the level of influence each factor has on each behaviour, from the deepest blue (very strong influence) to white (no influence).

As shown in Table 5, the study identified six key enablers that influence the various behaviours of interest. The desire to prevent blindness is vital for all behaviours. Generally, most people are proactive in protecting their sight for various reasons including personal wellbeing and security, social acceptance, ability to engage in economic activities etc. This desire is also supported by the widely-held belief that eye health is important and that screening for eye health is beneficial.

Appearance, intensity and severity of symptoms were also found to be a significant factor especially for Behaviours 1 and 2. Almost all the respondents showed up for screening and testing when they noticed some signs of reduced vision, and some pain and discomfort. While this factor is an enabler in this context, it is important to note that early detection is

critical for vision preservation, especially for glaucoma patients. The intensity and severity of symptoms, although to a lesser degree, also encouraged people to adhere to their treatment and follow-on appointments.

Quality of counselling and advice received from doctors at each stage of care appeared to be another significant factor. Some respondents mentioned that the explanations they got from the doctors regarding their eye condition were crucial to their follow-on behaviour. The counselling received encouraged those referred to the testing facility to get tested, and others to adhere to their medical appointments.

The importance of social factors came out clearly in the study, especially for Behaviour 1. Most respondents took a cue from friends and family members diagnosed with an eye disease or defect to go for screening/testing. Many also went for screening when the advice of the CDDs was reinforced by traditional and religious leaders. Family members were said to be of great help in reducing wastage when applying the eye drops (Behaviour 4) and in assisting respondents to go for testing and follow-on appointments (Behaviours 2 and 3).

Fear of surgery, with its associated misconceptions, was a major factor that influenced people to choose (uptake) eye drops and medications as their preferred treatment option. Conversely, preference for one-off treatment inspired some respondents to opt for surgery rather than apply eye drops for life (the coding in Table 5 refers only to the uptake of surgery, rather than adherence to treatment).

Table 6: Mapping of most significant barriers to behaviour change

Key behaviour influencers – barriers	Behaviour 1: attending eye-health screening	Behaviour 2: attending comprehensive eye testing	Behaviour 3: attending follow-on medical appointment	Behaviour 4: uptaking and adhering to treatment	
				Surgery	Eye drops
The belief of being incapable to protect eyesight					
Cost of care and treatment					

Key behaviour influencers – barriers	Behaviour 1: attending eye-health screening	Behaviour 2: attending comprehensive eye testing	Behaviour 3: attending follow-on medical appointment	Behaviour 4: uptaking and adhering to treatment	
				Surgery	Eye drops
Fear of surgery					
Poor attitude of some healthcare workers					
Limited personnel, services, drugs at PHC and UATH					
Lack of visible improvements from treatment					
Treatment longevity and associated discomfort					

*Findings may be anecdotal since only one respondent who underwent surgery was interviewed.

Colour coding: The different shades above show the level of influence each factor have on each behaviour, from the deepest blue (very strong influence) to white (no influence).

Seven barriers identified as the most critical influencers to behaviour change are mapped in Table 6. Prevalent amongst the respondents is the belief that they are powerless and incapable of protecting their eyesight. This belief is further entrenched by the fact that most of the respondents don't know what glaucoma is, many do not know when nor where to go

for eye health screening, some believe that blindness comes with age, and some are aware that that treatment does not restore vision. Put together, these reasons demotivate many from going for eye screening or testing or to continue with their treatment.

As expected, the cost of care and treatment emerged as a key barrier for most behaviours. This cost increases significantly as we move from Behaviour 2 to 4. According to the ophthalmologist at UATH, a comprehensive eye test costs about 3,000 naira (for central visual field test) or up to 12,000 naira (for optical coherence test). A fee for registration (700 naira) and consultation (2,000 naira) also applies.

Eye surgery for glaucoma costs about 40,000 naira (per eye) inclusive of drugs administered during surgery, plus the admission fee/one night at the hospital. Eye drops cost between 2,500 and 7,000 naira per bottle depending on the manufacturer - each bottle lasts for about one month. Because the UATH pharmacy often does not have the eye drops in stock, patients resort to buying from private pharmacies at a more exorbitant cost. During the height of the COVID-19 pandemic, the cost of these eye drops tripled as most imports were affected by the trade restrictions and lockdown across the globe.

While fear of surgery is an enabler for the uptake of eye drops as a preferred treatment option (see the previous section), conversely it is a direct barrier for the uptake of surgery. Most respondents have heard stories of failed surgeries; others are aware that surgery does not restore their vision, hence do not think it is a good option.

The poor attitude of some healthcare workers was identified by many as a key barrier and demotivator for most behaviours, but especially for Behaviour 3. Instances of verbal abuse, missing case files etc were reported by many respondents. It appears that some healthcare workers are unaware of the impact of their behaviour on their work and patients.

Limited personnel, services and drugs at PHC and UATH also came out as a key challenge for all behaviours. Most respondents complained that they spend the whole day waiting to see a doctor, at times only to be attended to by student doctors. In terms of services, at times, patients are asked to go for some tests outside the hospital, and most often prescribed medication is not available in the hospital. At the screening centre, individuals who were diagnosed with other eye defects (other than glaucoma) do not receive any care or counsel. These categories of people return home upset and discourage others from coming for screening.

Treatment longevity is another major barrier to adherence to follow-on appointments and treatment, as most patients chose the medication option rather than surgery (for reasons earlier discussed). The implication is that they are expected to apply eye drops for life and this comes with attendant challenges including forgetfulness in applying the drops every day, and pain and discomfort felt with the eye drops.

Another major demotivator that strongly influences the adoption of Behaviours 3 and 4 is the lack of visible improvements from treatment. Glaucoma treatment by nature does not restore vision, rather it maintains the status of the eye when treatment was commenced and prevents the eyes from deteriorating further. However, most patients get discouraged with time when they do not see marked improvements in their vision.

5.2. Proposed interventions to address the key barriers

Following the prioritisation of key insights in the above section, the study proceeded to propose intervention types and specific actions aimed at achieving expected outcomes per target behaviours (see mapping in **Table 7**).

The nine broad intervention types adopted from the Behaviour Change Wheel (BCW) include: education (increasing knowledge and understanding by informing, explaining, showing and providing feedback); persuasion (using words and images to change the way people feel about a behaviour to make it more or less attractive); incentivisation (changing the attractiveness of a behaviour by creating the expectation of a desired outcome or avoidance of an undesired one); coercion (changing the attractiveness of a behaviour by creating the expectation of an undesired outcome or denial of a desired one); training (increasing the skills needed for a behaviour by repeated practise and feedback); restriction (constraining performance of a behaviour by setting rules); environmental restructuring (constraining or promoting behaviour by shaping the physical or social environment); modelling (showing examples of the behaviour for people to imitate); and enablement (providing support to improve ability to change in a variety of ways not covered by other intervention types) [34].

Table 7: Proposed intervention types and specific actions aimed at achieving expected outcomes per target behaviour

Target behaviour to be influenced	Target outcomes	Intervention types								
		Education	Persuasion	Training	Incentivisation	Coercion	Modelling	Restriction	Environmental restructuring	Enablement
Behaviours 1 and 2 Attendance to eye screening centres and hospital testing facilities.	Individuals' belief in: 1. The existence of diseases that can cause them to become blind without their knowledge. 2. Their ability to protect their eyesight is enhanced.	Hold sensitisation events focusing on eye defects that are a 'silent thief of sight', and on how people can protect their eyesight. Design communication materials on ways people can protect their eyesight; disseminate to individuals at risk and community mobilisers.						Identify and share testimonials and success stories		
	At-risk individuals adopt the practice of going for regular eye-checks even without having any symptoms.	Hold awareness creation sessions on the dangers of late detection of eye defects. Engage traditional and religious leaders to sensitise their subjects on the need to attend regular eye screening.	Retrain community mobilisers on negotiation and persuasion skills.	Provide incentives at eye screening centres.	Use of eye pictures to show the effect of late detection of eye defects.	Identify and share testimonials and success stories on early detection.		Mount signage at PHC to sensitise people on available eye care services.		
	Access to eye screening at PHC, and clinical services at UATH improved.							Explore the potential of increasing staff strength and/or clinic days. Expand intervention to other eye diseases like cataract.		
	Cost of care (eye testing) more affordable.							Seek funding to introduce subsidies and to organise free medical outreaches. Stimulate individual and private sector CSR contributions.		

Target behaviour to be influenced	Target outcomes	Intervention types								
		Education	Persuasion	Training	Incentivisation	Coercion	Modelling	Restriction	Environmental restructuring	Enablement
Behaviours 2 and 3 Attendance to eye screening centres and regular follow-up appointments,	Healthcare workers become more empathetic and supportive of patients.	Hold interactive sessions to discuss the effect of healthcare workers' actions on patients and how to overcome challenges and be more supportive.	Train healthcare workers on ethics, soft skills including negotiation and communication skills.	Establish a monthly award for 'best healthcare worker'.				Enforce hospital rules on patient care and management.		
Behaviours 3 and 4 Attendance to regular follow-up appointments and adherence to treatment	Cost of care and treatment (surgery and eye drops) more affordable.							Seek funding to introduce subsidies, and to organise free medical outreaches. Encourage patients to sign up on NHIS. Advocate for the inclusion of more glaucoma drugs in NHIS Advocate to the government to allocate more funds to glaucoma and eye health. Stimulate individual and private sector CSR contributions.		
	Availability of eye medications in UATH pharmacy increased.							Advocate for improved supply of eye medications at UATH. Stimulate individual and private sector CSR contributions.		
	Acceptance and adherence to medication treatment increased (despite the lack of visible improvements).	Hold enlightenment events for patients to enhance knowledge on glaucoma and treatment purpose/outcomes.					Show patients the effect of non-adherence to treatment			
	Patients' ability to cope with	Hold sensitisation sessions to educate								Create and manage

Target behaviour to be influenced	Target outcomes	Intervention types								
		Education	Persuasion	Training	Incentivisation	Coercion	Modelling	Restriction	Environmental restructuring	Enablement
	treatment longevity and associated discomforts strengthened.	patients on how to cope with their treatment plans. Design and disseminate communication materials on coping strategies for long-term treatment regimen.								forums/ support groups for peer aid/ assistance.
Behaviour 4	Patients' acceptance of surgery as a means of vision preservation strengthened.	Organise awareness creation events on the pros/cons of surgery as a treatment option. Provide scheduled individual and/or group counselling opportunities. Design and disseminate SBC materials to stimulate acceptance of surgery.					Identify and share surgery-related testimonials and success stories.			

The specific intervention actions were mostly derived from the suggestions by the primary study respondents (individuals at risk of glaucoma, patients diagnosed with glaucoma and CDDs) including the clinicians who served as key informants. Also, a few suggestions from literature on ways to support individuals on lifelong medications to adhere to their treatment regimens were added.

To jointly improve attendance to eye health screening centres (Behaviour 1) and hospital testing facilities (Behaviour 2), four related outcomes must be achieved. These include enhancing individuals' belief in both the existence of diseases that can cause them to become blind without their knowledge and in their ability to protect their eyesight; individuals at risk adopting the practice of going for regular eye checks even without having any symptoms; improving access to eye screening at PHC and clinical services at UATH; and making the cost of care (eye testing) more affordable.

- To strengthen belief, the following actions were proposed: sensitisation and enlightenment activities to enhance knowledge on eye diseases that cause a gradual loss of sight, and how people can protect their eyesight; design communication materials on ways people can protect their eyesight and disseminate these materials using appropriate channels and sources (including community mobilisers and traditional and religious leaders) to stimulate desired behaviour change.
- Promoting the culture of at-risk individuals going for regular eye-checks (even without having any symptoms) requires the following actions: awareness creation sessions on the dangers of late detection of eye diseases; retraining of community mobilisers on negotiation and persuasion skills; increasing logistics stipends for the mobilisers to enable proper coverage of catchment areas including repeated visits to individuals at risk for persuasion and follow-ups; provision of incentives (goggle frames, eye drops, over the counter medications etc) during screening days to spur attendance; use of eye pictures to show the effect of late detection of eye defects; identification and sharing of testimonials and success stories on early detection, and mounting signages at the PHC (with inscriptions on local language) to sensitise people on available eye care services.
- To improve access to eye screening at the PHC and clinical services at UATH, the number of staff available to patients and/or the number of clinic days should be increased to ensure that patients spend a minimal amount of time in the facilities. At the PHC, interventions should be expanded to cover other eye diseases like cataract.
- Regarding the affordability of eye testing, the potential of seeking funding to introduce subsidies and to organise free medical outreaches should be explored alongside the possibility of stimulating increased individual and private sector corporate social responsibility (CSR) contributions.

To further improve eye-testing seeking behaviour (Behaviour 2) and achieve increased attendance to regular follow-on appointments (Behaviour 3), the poor attitude exhibited by some healthcare workers should be addressed. The target outcome is to ensure that healthcare workers become more empathetic and supportive of patients.

- To this end, interactive sessions should be held to discuss the effect of healthcare workers' actions on patients and how to overcome challenges and be more supportive; healthcare workers should be retrained on professional ethics and soft skills including negotiation and communication skills. A monthly award could be introduced to reward and recognise healthcare workers that excel in patient management and care. Simultaneously, hospital rules on patient care and management should be enforced.

Influencing attendance to regular follow-on appointments (Behaviour 3) and adherence to treatment (Behaviour 4) require attaining four related outcomes - making the cost of care and treatment (surgery and eye drops) more affordable, increasing the availability of eye medications in UATH pharmacy, increasing acceptance and adherence to medication treatment (despite lack of visible improvements), and strengthening patients' ability to cope with treatment longevity and associated discomforts.

- To reduce cost, the following are proposed: fundraising efforts to enable the introduction of subsidies and free medical outreaches, supporting patients to sign-up to the national health insurance scheme (NHIS), advocacy to the government to include more glaucoma drugs in NHIS and allocate more funds to glaucoma treatment and eye health, and stimulating more individual and private sector CSR contributions.
- Regarding increasing the availability of eye medications in the UATH pharmacy, advocacy to relevant UATH authorities and working towards stimulating increased individual and private sector CSR contributions are suggested.
- On improving acceptance and adherence to increased medication treatment (despite lack of visible improvements), enlightenment events should be held to enhance knowledge on glaucoma and treatment purpose/outcomes. Patients should be shown the effect of non-adherence to treatment.
- To strengthen a patient's ability to cope with treatment longevity and associated discomforts, sensitisation sessions should be held to educate patients on proven ways to cope with their treatment plans. Communication materials on coping strategies for long-term treatment regimen should be designed and disseminated, and peer forums/support groups should be created and supported to ensure that patients continue to encourage and motivate each other.

Lastly, to improve uptake of surgery, patients' acceptance of surgery as a means of vision preservation must be strengthened. To achieve this, awareness creation events on the pros/cons of surgery as a treatment option should be organised, individual and/or group counselling opportunities should be made available, SBC materials to stimulate acceptance of surgery should be designed and disseminated, and surgery-related testimonials and success stories should be shared.

5.3. Conclusion and next steps

Sightsavers should review the proposed intervention actions alongside the key insights from the study. Proposed actions could be further restructured into two categories of short-term solutions (quick wins within Sightsavers' manageable interests, scope and capacity) and longer-term interventions (system-wide solutions that require other external stakeholders external to the project).

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Annexe 1 – Details of local glaucoma literature reviewed

S/n	Study theme	Study title	Year of publication	Study location	Participants	Design/method	Link
1	Eye health screening	Glaucoma Awareness and Knowledge, and Attitude to Screening, in a Rural Community in Ebonyi State, Nigeria	2016	Ebonyi State, Nigeria	402 respondents: 228 (56.7%) women and 174 (43.3%) men were interviewed.	Cross-sectional descriptive study	http://dx.doi.org/10.4236/ojoph.2016.62017
2	Eye health screening	So, let me find my way, whatever it will cost me, rather than leaving myself in darkness: experiences of glaucoma in Nigeria	2016	Abuja FCT and Kaduna State, Nigeria	120 participants	Qualitative study	http://dx.doi.org/10.3402/gha.v9.31886
3	Eye health screening	The effect of a reminder short message service on the uptake of glaucoma screening by first-degree relatives of glaucoma patients: a randomised controlled trial.	2020	Plateau State, Nigeria	200 FDRs of patients with POAG were invited through phone for free glaucoma screening and randomly allocated into two groups.	Randomised controlled trial	DOI: 10.4103/meajo.MEAJO-98-19
4	Eye health screening	Eye Care Practices, Knowledge and Attitude of Glaucoma Patients at Community Eye Screening Outreaches in Nigeria.	2020	Oyo state Nigeria	1881 patients	Qualitative and quantitative study	https://doi.org/10.21203/rs.3.rs-60150/v1

S/n	Study theme	Study title	Year of publication	Study location	Participants	Design/method	Link
5	Eye health screening	Factors influencing eye-care seeking behaviour of parents for their children in Nigeria.	2018	Edo State, Nigeria	35 parents and 10 eye-care practitioners	Qualitative narrative study	DOI:10.1111/cxo.12506
6	Eye health screening	Perceptions of Barriers to the Uptake of Diabetic Eye Screening Among Diabetic Eye Patients in Owo, Nigeria	2013	Ondo, Nigeria	100 diabetic patients	Cross-sectional descriptive study	DOI:10.4172/2324-8599.1000108
7	Treatment adherence	Advanced glaucoma at presentation is associated with poor follow-up among glaucoma patients attending a tertiary eye facility in Southern Nigeria	2018	Southern Nigeria	348 patients were recruited, 54 per cent were male and the mean age was 52.7 (range 16-88) years	Analysis of hospital case records	DOI: 10.1080/09286586.2018.1424345
8	Treatment adherence	Compliance with topical glaucoma medications in Owo, Nigeria	2013	Ondo State, Nigeria	100 respondents (glaucoma patients; 60 males and 40 females)	Semi-structured questionnaire	BIMJ April 2013 (bimjonline.com)
9	Treatment adherence	Factors affecting compliance with glaucoma medications in Nigeria	2016	Oyo State, Nigeria	180 glaucoma patients	Descriptive hospital-based cross-sectional study	
10	Treatment adherence	Follow-up and adherence to glaucoma care by newly diagnosed	2019	Enugu State, Nigeria	182 newly diagnosed glaucoma patients	Cross-sectional survey	DOI: 10.1080/09286586.2018.1555263

S/n	Study theme	Study title	Year of publication	Study location	Participants	Design/method	Link
		glaucoma patients in Enugu, Nigeria					
11	Treatment adherence	Glaucoma Medication Adherence in an Adult Population in Nigeria	2017	Edo State, Nigeria	49 participants who had been diagnosed with glaucoma and had been on glaucoma medications for at least a year	One-on-one in-depth interviews	DOI: 10.4103/ajmhs.ajmhs_80_16
12	Treatment adherence	Reported medication adherence by glaucoma patients in a Nigeria hospital	2019	Ekiti State, Nigeria	338 glaucoma patients	Cross-sectional study	DOI: 10.15406/aovs.2019.09.00363
13	Treatment adherence	Self-reported adherence rates in glaucoma patients in Southwest Nigeria	2016	Lagos State, Nigeria	Glaucoma patients 44 males (38.6 per cent), 70 females (61.4 per cent)	Hospital-based cross-sectional design	DOI: 10.4103/2408-7408.179649
14	Treatment uptake	Patient Refusal of Glaucoma Surgery and Associated Factors in Lagos, Nigeria	2013	Lagos State, Nigeria	208 newly diagnosed glaucoma patients were recruited	Multi-centre cross-sectional survey	DOI: 10.4103/0974-9233.110612
15	Treatment uptake	Can adapted motivational interviewing improve uptake of surgical or laser treatment for glaucoma in Nigeria: randomised controlled trial	2017	Bauchi State, Nigeria	276 glaucoma patients participated	Qualitative research	DOI: 10.1097/IJG.0000000000000729

S/n	Study theme	Study title	Year of publication	Study location	Participants	Design/method	Link
16	Treatment uptake	Primary open angle glaucoma in northern Nigeria: stage at presentation and acceptance of treatment	2015	Bauchi State, Nigeria	131 prospectively new glaucoma patients aged 30 or more years; included distance from residence and what they knew about glaucoma and its treatment	Cross-sectional study	https://doi.org/10.1186/s12886-015-0097-9
17	Treatment uptake	The awareness, perceptions and experiences of primary open angle glaucoma patients in Lagos Nigeria	2014	Lagos, Nigeria	120 POAG patients	Cross-sectional study	DOI: 10.1038/srep07585
18	Uptake and adherence	Glaucoma, the silent thief of sight: patients' perspectives and health seeking behaviour in Bauchi, northern Nigeria	2016	Bauchi State, Nigeria	66 patients	Hospital based qualitative study	DOI 10.1186/s12886-016-0220-6

Annexe 2 – Prioritisation of key enablers and barriers





Factors that influence Behaviour 1 (see Figure 6)	Factors that influence Behaviour 2 (see Figure 7)	Factors that influence Behaviour 3 (see Figure 8)	Factors that influence Behaviour 4 (see Figure 9)
Enablers			
Desire or apathy to status of sight	Resolve to restore eyesight to normalcy	Desire to prevent blindness	Awareness of the consequence of non-adherence
Level of eye health knowledge	Individual appreciation of good eyesight	Maintenance of vision	Fear of blindness
Individual care negligence	Fear of blindness	Belief that regular hospital visits are key to maintaining eyesight	Maintenance of vision
	Knowledge of the effect of untreated glaucoma	Awareness of the consequence of neglecting their appointments	Improvements in eyesight
		Improvements in eyesight	
Emerging symptoms of eye defects	Emergence of symptoms		
Condition of an individual's eyesight	Ability to engage in usual daily activities		
Symptoms of eye defects			
	Quality of enlightenment received during the screening	Encouragement by the doctors	
	Perceived competence of UATH in eye care	Rescheduling of missed appointments	
Knowledge of family members with eye problems		Testimonials from those receiving treatments	Testimonials from those receiving treatments

Factors that influence Behaviour 1 (see Figure 6)	Factors that influence Behaviour 2 (see Figure 7)	Factors that influence Behaviour 3 (see Figure 8)	Factors that influence Behaviour 4 (see Figure 9)
Advice and prompts from family and friends			Help from family in applying eye drops to avoid wastage
Trust for the guidance of the CDDs			
Advice from traditional rulers and religious leaders			
			Fear of surgery
			Fear of dependence on medications for life
Personal habit of routine health checks		Cost of treatment in UATH is cheaper than in private hospitals	Potency of prescribed eye drops
Preference for traditional medicine		Lack of knowledge of alternative hospitals for treatment	Individual financial strength
Information on treatment outcomes			Use of phone alarms as reminders
Barriers			
The belief of being incapable to protect eyesight			
			Perceptions that blindness come with age
Perception on treatment cost	Cost of eye testing	Treatment cost	Cost of treatment - surgery, eye drops
	Cost of treatment		High cost of medication
Fear of surgery			Personal experience with surgery



Factors that influence Behaviour 1 (see Figure 6)	Factors that influence Behaviour 2 (see Figure 7)	Factors that influence Behaviour 3 (see Figure 8)	Factors that influence Behaviour 4 (see Figure 9)
			Stories of failed surgeries
			Fear of surgery
Attitude of health workers	Attitude of health workers	Poor conduct of some health workers	
Range of eye health services at the screening centre	Chances of seeing a doctor	Possibility of not seeing a doctor (inadequate staffing at UATH)	Unavailability of specific eye drops prescribed at the drug stores
Waiting period at the screening centre		Occurrences of missing hospital case records/files	Persistent non-availability of the drugs at UATH pharmacy
Chances of seeing a doctor, receiving care		Being attended to by student doctors	Occasional non-availability of eye drops at other drug stores
		Length of time spent at UATH	
		Absence of drugs at UATH	
Post-treatment outcomes	Perception of treatment outcome	Demotivation from lack of significant improvement on their sight	Information on negative outcomes from surgery
			Knowledge that treatment does not restore vision
			Treatment longevity
			Pain and discomfort after applying eye drops
			Forgetfulness in applying the drops every day

Factors that influence Behaviour 1 (see Figure 6)	Factors that influence Behaviour 2 (see Figure 7)	Factors that influence Behaviour 3 (see Figure 8)	Factors that influence Behaviour 4 (see Figure 9)
Information on eye care opportunities	Preference for traditional herbs	Positive reputation of UATH in eye healthcare	Conflicting personal schedule
Prioritisation of daily activities	Religious/faith-based beliefs	Health campaigns by religious organisations	Perceived ineffectiveness of some of the eye drops
Distance to screening centre	Proximity of residence to UATH		
Availability of incentives at the screening centres			
Occasion of free medical outreach			
Religious or faith beliefs			

Annexe 3 – Data collection tools


Respondent categories	Questionnaire, FGD and KII checklists
Individuals at risk of glaucoma	 DATA COLLECTION TOOLS FOR INDIVIDUALS
Patients diagnosed with glaucoma	 DATA COLLECTION TOOLS FOR PATIENTS
Clinicians – ophthalmologist and optometrist	 DATA COLLECTION TOOLS FOR CLINICIANS
Community drug distributors (CDDs)	 DATA COLLECTION TOOL FOR COMMUNITARIANS

Annexe 4 – Data sets

Description	Data set
Demographics of patients diagnosed with glaucoma	 Demographics_-_Patients_Diagnosed_with_
Demographics of individuals at risk of glaucoma COM-B survey (Likert scale tool) responses	 Individuals_At_Risk_Of_Glaucoma_-_latest

Annexe 4 – Data collection photos

Attached previously



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