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## Glaucoma Medication Adherence among African Americans: Program Development

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### Abstract

**Purpose**—To elucidate barriers and facilitators related to glaucoma medication adherence among African Americans (AA) with glaucoma and to elicit input from a community-based participatory research team in order to guide the development of a culturally informed, health promotion program for improving glaucoma medication adherence among AA's.

**Methods**—The nominal group technique (NGT), a highly structured focus group methodology, was implemented with 12 separate groups of AA's patients with glaucoma (N = 89) to identify barriers and facilitators related to glaucoma medication usage. Participant rank-ordering votes were summed across groups and categorized into themes. Next, an individually and culturally targeted health promotion program promoting appropriate medication adherence was developed based on focus group results and input from a community-based participatory research team.

**Results**—The top five barriers included problems with 1) forgetfulness, 2) side effects, 3) cost/affordability, 4) eye drop administration, and 5) the eye drop schedule. The most salient top five facilitators were 1) fear or thoughts about the consequences of not taking eye drops, 2) use of memory aids, cues, or strategies, 3) maintaining a regular routine or schedule for eye drop administration, 4) ability to afford eye drops, and 5) keeping eye drops in the same area. The resulting health promotion program was based on a multi-component empowerment framework that included glaucoma education, motivational interviewing, and problem-solving training to improve glaucoma medication adherence.

**Conclusions**—Barriers and facilitators related to glaucoma medication adherence among AA's are multifactorial. Based on the NGT themes and input from the community-based participatory research team, a culturally informed, health promotion program was designed and holds great promise for improving medication adherence among this vulnerable population.

### Keywords

medication adherence; focus groups; community-based participatory research; African Americans; glaucoma

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Glaucoma is a leading cause of irreversible vision loss in the United States and is expected to affect 3 million persons in 2020, creating an immense and costly public health challenge.<sup>1,2</sup> The most common form of glaucoma is primary open angle glaucoma (POAG) which requires long-term ocular hypotensive medical treatment, surgery, or both in order to

maintain intraocular pressure, thus preventing optic nerve damage and blindness.<sup>3</sup> African Americans (AA) represent a vulnerable segment of the population who experience a disproportionate burden of serious chronic health conditions, glaucoma included.<sup>4,5</sup> Cross-sectional studies and those using national datasets estimate that glaucoma-related vision impairment is between six and eight times more common among AA's than among Caucasians.<sup>6</sup> Disproportionate rates of glaucoma treatment have also been found, with AA's receiving less potentially sight-saving care for open-angle glaucoma compared to Caucasians.<sup>7</sup>

To preserve vision and minimize deterioration, successful long-term pharmacological therapy management is necessary to lower intraocular pressure (IOP). This requires patient adherence to prescribed ophthalmic eye drops as the treatment of choice. The current generation of prostaglandin IOP-lowering drugs offer once per day dosing regimens and reduced adverse effects compared with preceding drug therapies.<sup>8</sup> Clinical trials demonstrate that lowering IOP with pharmacologic therapies reduces vision loss in ocular hypertension.<sup>9,10</sup> Thus, consistent adherence to such medications is critical for delaying disease progression and vision loss.

Despite the availability of effective topical glaucoma therapies, many patients do not use ocular hypotensives in the manner prescribed by ophthalmologists and optometrists.<sup>11,12</sup> Non-adherence among patients with glaucoma has been reported to range as high as 80% across 34 studies.<sup>13</sup> Recent reports have found that more than 90% of patients with glaucoma fail to refill their ocular medications continuously during the initial year of therapy and that less than 60% continue to refill eye drop prescriptions at one year.<sup>14</sup> Only a few studies have examined barriers related to regular glaucoma adherence. Of the barriers identified, the most salient include the cost of glaucoma medications (e.g., estimated \$1,198 up to 1,290 during the first year),<sup>3,15</sup> forgetfulness, and problems with drop application, among others.<sup>16,17</sup> While informative, these studies have been predominantly conducted among Caucasian populations.

Emerging evidence suggests health disparities in glaucoma medication adherence. Our group recently conducted a study of objective medication adherence with topical glaucoma therapy in a sample of 113 patients (46 AA, 67 Caucasian) with POAG.<sup>11</sup> Results showed that Caucasians met the criteria for full treatment adherence on 71.2% of treatment days, whereas AA's were adherent for only 53.4% of treatment days. It was also found that race significantly predicted treatment adherence while statistically controlling for age, gender, income, education, number of oral medications, severity of disease, and IOP. Race was the only significant independent predictor of glaucoma medication adherence. These results highlight the disproportionate rates of glaucoma medication non-adherence among AA's compared to Caucasians. Unfortunately, lacking are studies examining both the barriers as well as facilitators among AA's needed to further understand the scope of reasons for this disparity.

From a historical perspective, health disparities among AA's can be traced back to a legacy of slavery, racism, oppression, inequality, and social discrimination.<sup>18–20</sup> Unfortunately, many of these problems are still pervasive to this day and continue to shape the experiences and behavioral responses among both minority and non-minority groups.<sup>21</sup> Oppressed groups may be at particular risk of feeling powerless over their health because of negative self-evaluations, negative experiences with healthcare, and social barriers that impede effective actions.<sup>22</sup> Ongoing problems with oppression that contribute to health disparities among AA's have strong implications for empowerment-based approaches to change behavior.<sup>23,24</sup> Among the many definitions of empowerment is the ability to influence people, organizations, and/or the environment affecting one's life.<sup>25</sup> The personal level of

empowerment is concerned with the individual's feelings of personal power and self-efficacy.<sup>26</sup> Approaches based on this perspective utilize techniques to facilitate the transition from powerlessness to empowerment by raising consciousness, motivation for change, identifying and building upon existing strengths, training members in problem-solving, mobilizing resources, and analyzing how powerlessness is affecting their situations.<sup>27</sup> Because non-adherent behavior is multifactorial in nature, research has shown that multi-component health promotion programs that include education and motivation as well as training in strategies to more effectively self-manage health conditions are most effective when program components relate to the population of interest and are individually tailored.<sup>28,29</sup> As such, an empowerment framework may have great potential to contribute to a reduction in gaps in health status among persons from vulnerable populations.

While a few health promotion interventions have been studied to date, limitations exist in that they are not designed for AA's (i.e., tested on Caucasian patient populations; demonstrate higher attrition rates among AA's than Caucasians) and/or have methodological limitations (i.e., utilize impersonal approaches such as interaction with automated voice recognition technology; work to prepare readiness for change versus skill acquisition; rely upon self-report measures of improvements of adherence; and/or do not take into consideration variation of individual's circumstances influencing glaucoma medication management).<sup>30-33</sup> Thus, in order to reduce the health disparity in glaucoma medication adherence, the design of culturally meaningful, health promotion programs based on input from direct consumers (AA patients with glaucoma) are needed.<sup>34,35</sup> Here we describe the formative research process of developing a culturally informed, health promotion program to improve medication adherence among AA's. First, we conducted several structured focus groups with AA's glaucoma patients in order to identify barriers as well as facilitators related to glaucoma medication adherence. Second, we used the resulting information, along with input from an AA consumer-based advisory board and our research team, to develop culturally meaningful program materials (i.e., health educator manual, patient workbook/worksheets, educational resources) and to guide the selection of a theoretical approach consistent with the empowerment framework.

## METHODS

### Participants

This study was approved by the university institutional review board for human use and adhered to the tenants of the Declaration of Helsinki. The study sample consisted of participants recruited from the Glaucoma Service, Department of Ophthalmology, University of Alabama at Birmingham. Eligibility criteria for study inclusion were: 1) self-reported AA race, 2) age > 21 years old, 3) diagnosed with open angle glaucoma or ocular hypertension in one or both eyes for at least 1 year minimum, 4) using or prescribed a prostaglandin analog 5) English speaking; and 6) cognitively oriented and able to communicate. A medical chart review of persons who had been seen in the Glaucoma Service over the past year, prescribed glaucoma medication, and were diagnosed with open angle glaucoma or ocular hypertension was conducted as part of an initial screen. A letter was then mailed (N = 317) and followed up with a telephone call to determine eligibility. During the follow-up phone call, 127 patients (40.1%) were further screened for eligibility and 190 (59.9%) were not screened (i.e., disconnected telephone number, deceased, no returned call after messages were left, undeliverable address, or refused to hear more about the study). Of the remaining 127 patients, 120 were eligible and 7 were ineligible (N = 4 had significant cognitive problems, N = 2 were not AA, N = 1 was not prescribed glaucoma medication). Of the 120 eligible participants, 98 enrolled and attended a focus group (82%) and 22 patients either no showed or canceled and did not reschedule (18%).

Enrolled participants were randomly scheduled to participate in one of the available focus groups depending upon their preference until the selection of times/days for the groups were filled. Given the random nature of scheduling, the make-up of the groups represented a mix in terms of gender, age, and socio-demographic background. The average size of the groups was approximately 6 patients with a range of 5 to 10 patients. An initial focus group was conducted to pilot test the protocol (N = 9) but was not part of focus group data collection. The actual length of each group was approximately 2 hours. Given the structured nature of the NGT procedure, the discussion process for each question typically lasted one hour, and participants received monetary compensation. Recruitment occurred over the spring of 2009, and the focus groups were conducted across the remaining months in 2009. The development of the health promotion program was conducted over the following year.

## Procedure

**Nominal Group Technique (NGT)**—Prior research illustrates the utility of structured focus groups in identifying issues facing persons with vision impairment<sup>36–38</sup> and other chronic health conditions.<sup>39–41</sup> One approach in particular that has been used in a variety of health research topics is known as the nominal group technique (NGT).<sup>39,42</sup> The NGT is a highly structured and effective format useful for eliciting and systematically organizing perceptions among participants by gathering equally weighted responses that offer a valid representation of group views.<sup>43</sup> NGT has been used as a consensus-building tool to represent a diverse range of views particularly as it relates to reaching underserved populations such as racial/ethnic minorities.<sup>28,34,35,44,45</sup> Researchers have used NGT in health research because of its usefulness in combining both quantitative and qualitative methodology to achieve group consensus in a structured manner.<sup>39,46,47</sup> When applied in the formative research phase, the information obtained can be used to guide the development and/or modification of programs targeted to the population of interest.<sup>28,35,46</sup> For the study, a total of 12 focus groups were conducted. Background demographic and health-related data was collected over the telephone after participation in one of the focus groups. A summary of the steps involved in the NGT procedure are highlighted in Table 1.

## Development a Health Promotion Program

Upon completion of data collection for the focus groups, a small consumer-based advisory board (CBAB) of AA's with glaucoma convened as part of a community-based participatory research approach to integrate information summarized from the focus group meetings and to further understand how AA cultural experiences and perspectives related to health care (i.e., socioeconomic inequalities, caregiving responsibilities, history of racism, views of health care systems, health, and medication) might effect adoption of the program materials. These persons had previously participated in another project in which we designed culturally relevant social support group materials and activities (UAB CONNECTIONS) for our Department of Ophthalmology's mental health clinical research services. The CBAB was asked to share their own unique experiences (i.e., quotes, stories, experiences with optometrists and ophthalmologists) and provide input for the content for the health promotion program materials (i.e., role-playing activities; examples of intervention components; wording) in a manner consistent with the values, beliefs, and language of the AA culture. The CBAB and research team also reviewed several theoretical-based, empowerment approaches to serve as the components of the health promotion program. Because of the multifactorial nature of non-adherence, consideration of approaches that provided motivation, education, and training in specific skills for overcoming barriers to glaucoma management were emphasized. After the research team integrated the information, the CBAB provided further feedback, and then a final iteration was conducted resulting in a: 1) health promotion program workbook and worksheets for improving

glaucoma medication adherence among AA's with glaucoma and 2) health educator program manual of procedures.

### Statistical Analyses

When all NGT meetings had been conducted, the investigative team employed a formal distillation process to identify the common themes that were generated across the different focus groups. The top five ranked responses per participant for each focus group were analyzed separately, allowing researchers to move between qualitative analysis (coding) and quantitative analysis (counting recording units).<sup>48</sup> The next step in the analysis was to combine responses by category theme from all groups and to total the number of rank-ordering votes participants assigned to each category theme. Two researchers began initial categorization of the data by listing and tallying responses across groups. The researchers met to review participants' responses. After all responses had been coded, they were grouped into category themes and again reviewed until consensus was reached. The iterative process allowed the category themes to emerge.<sup>45</sup>

## RESULTS

Eighty-nine AA glaucoma patients participated in one of 12 focus groups (See Table 2 for sociodemographic characteristics). The average age of participants was 65 years with a range of 38 to 97 ( $SD = 13.18$ ). Of the 89 participants, 56 were women (62.9%) and 33 were men (37.1%). In terms of educational level, about a quarter of the sample had less than 12 years of education, followed by another quarter having a highschool degree or equivalent, and another quarter having at least 2 years of college or an Associates degree. The remainder of the sample had a bachelors degree and/or some post-graduate coursework without a formal degree, and a smaller subset had a post-graduate degree. The majority of the participants were married and retired. Participants were living with, on average, a total 5 chronic health conditions. In terms of annual household income range, there was wide variety within the sample and representative of different socioeconomic levels. In terms of ocular characteristics, average visual field mean deviation was  $-5.5$  ( $SD = 8.42$ ) for OD and  $-7.1$  ( $SD = 9.18$ ) for OS. Lastly, in terms of visual acuity, average logMAR scores were .29 ( $SD = .26$ ) for OD and .28 for OS ( $SD = .30$ ).

### Categories/Themes

The five most frequently cited *barriers* to glaucoma medication management summarized across groups were related to problems with forgetfulness (191 votes), side effects (171 votes), cost/affordability (102 votes), difficulty with drop administration (96 votes), and the eye drop schedule (80 votes). In contrast, the five most frequently cited *facilitators* to glaucoma medication adherence were fearing or thinking about the consequences of not taking drops (187 votes), using memory aids, cues, and/or strategies (visual/auditory cues, family or friend assistance, and other cues) (153 votes), recognizing the importance of eye drops on eye health/knowledge (127 votes), keeping the same schedule/routine for eye drop administration (117 votes), and being able to afford eye drops (92 votes). See Tables 3 and 4 for a full list of barriers and facilitators and rank-ordering votes across groups.

### Development of a Health Promotion Program

After a discussion of the focus group findings along with consideration of an approach based on an empowerment framework, a multi-component based health promotion program consisting of 1) glaucoma and glaucoma medication education, 2) problem-solving training (PST), and 3) motivational interviewing (MI) was decided upon.<sup>49,50</sup> The materials selected by the CBAB for the educational components included: "*Understanding and Living with Glaucoma*" and "*African Americans and Glaucoma*" published by the Glaucoma Research

Foundation, the “*Glaucoma: What you should know*” published by the National Eye Institute (NEI), and a brief quiz, *Glaucoma Eye-Q Test*, from the National Eye Health Education Program (NEHEP). The team developed program materials utilizing the barriers/facilitators from the NGT, components of MI and PST, and the educational materials. Next, another iteration of the review process was conducted with the CBAB.

Several CBAB members provided comments to enhance the cultural relevance of program materials and engagement in the program. For example, incorporating information related to accessing local resources within the AA community that might influence factors (positive or negative) related to regular medication adherence (i.e., public transportation, community resources in the surrounding urban and rural areas, churches, inspirational motivators that could be incorporated within the materials based on the gospel) was recommended. The CBAB also provided input on the wording and organization of program materials (i.e., presentation of information through the use of storytelling; incorporation of barriers/facilitators from the NGT meetings; taking personal responsibility but also finding additional strength in religion; encouraging potential participants to reach out to community leaders/churches to help with barriers or for ongoing support, particularly when other stressors may interfere with regular management). Furthermore, they addressed potential participation barriers. Because of the distance and costs related to travel, they recommended a predominantly telehealth-based approach. Through further discussion, the CBAB suggested that the initial session be conducted in-clinic to build trust and rapport. The research team also felt this would allow the health educator the opportunity to provide direct training in appropriate eye drop administration, observe any discrepancies in verbal and non-verbal communication with regards to readiness to change as part of MI, and enhance therapeutic rapport as well. Lastly, the CBAB also recommended incorporating a brief quiz on glaucoma for facilitators to understand patient glaucoma knowledge and to also serve as another tool to build initial trust.

The resulting name of the health promotion program was called GOAL, “*Glaucoma Management Optimism for African Americans Living with Glaucoma*.” An overview of the GOAL protocol and goals for each session can be found in Table 5.

## DISCUSSION

The primary purpose of this study was to use formative research (NGT focus groups and community-based participatory research team) to guide the development of a culturally informed health promotion program to improve glaucoma medication adherence among AA’s. The NGT process identified a comprehensive set of barriers and facilitators related to glaucoma medication adherence experienced by AA’s with glaucoma. There are several advantages to this approach. First, the use of the NGT involved direct consumers/stakeholders (i.e., AA’s patients with glaucoma) in the research process that is particularly valuable in the early phase of program development. AA patients had the opportunity to voice issues that were most important to them. The focus on consumers also minimized bias and assumptions from researchers and clinicians. A second advantage is that the weight of each member’s opinion in their rank-ordering votes is the same and that process loss is less likely to occur. Third, the NGT provides a fairly rapid means of eliciting community input with relatively low burden. Furthermore, the highly structured format and deliberate avoidance of interference or interpretation from a facilitator does not interfere with or influence the group members in contrast to structured clinical interviews or other types of unstructured focus group procedures which require rater interpretation that can bias coding themes/comments. The NGT allows practitioners and researchers to see a list of issues or recommendations in prioritized areas based on patient consumer rank-ordering votes.

While several of the barriers related to glaucoma medication adherence among AA's were similar to those reported in previous studies conducted with predominantly Caucasian populations, a community-based participatory research team further helped the research team to recognize the unique cultural experiences and perspectives of AA's regarding medication adherence and glaucoma and to provide feedback on the content development and presentation of the program materials for AA's. Additionally, the team helped to identify potential logistic concerns (i.e., method of delivery of program) for consideration in the development of the program, GOAL. While such practical concerns are important to the success of a health promotion program,<sup>28</sup> also important is the perspective of the program approach and how it is framed relative to AA patient experiences.

The CBAB recommendation for the selection of an empowerment-based theoretical framework focusing on the principles of PST and MI combined with glaucoma management education may help facilitate patients' readiness to change health behaviors (i.e., glaucoma medication adherence) and to learn skills such as problem-solving in order to more systematically tackle problems related to medication management. PST approaches stipulate that individuals differ in their (1) cognitive-behavioral skills that influence the processing of information about their health problems, (2) ability to regulate emotional experiences when problem solving health problems, and (3) ability to implement effective strategies for resolving health-related problems.<sup>51</sup> PST has been shown to lead to positive health behaviors and adjustment among persons with health-related problems<sup>52-56</sup> and has also been found to be well-received among AA's when culturally relevant.<sup>55,57</sup> Elements of a positive problem orientation, the motivational component, function to promote personal confidence, self-efficacy, positive moods, and a sense of self-confidence in stressful situations. MI techniques can help enhance a person's problem orientation as the techniques are designed to prepare persons for change by 1) examining readiness to change health behaviors, 2) understanding ambivalence about change, 3) identifying perceived barriers to goals, and 4) making a commitment to change health behaviors.

The information obtained from this qualitative study can also help guide doctor-patient interactions. For example, eye care providers can use this information to 1) direct more meaningful conversations with AA patients regarding glaucoma medication management education, 2) assess potential barriers, and 3) identify strategies to overcome or prevent such obstacles. Given that the barriers in this study ranged in terms of complexity along with the fact that successful behavior change requires both motivation as well as training in new skills over time, eye care providers should also consider referring patients with complicated histories or failed prior attempts to manage glaucoma medications to health care providers with specialized training in behavioral health interventions (i.e., clinical psychologists; rehabilitation/health psychologists). Incorporation of these types of health educators as part of multidisciplinary eye healthcare teams is warranted for prevention efforts, treatment, and/or consultation, particularly in busy clinics where eye care providers may not have the additional time to adequately provide detailed health education regarding glaucoma and/or have the appropriate training needed to successfully deliver such programs. This may be particularly important when other neurocognitive or psychiatric problems may be also influencing medication adherence (i.e., depression, dementia, substance abuse, family problems, personality disorders).

While the implications from this study are promising for eliminating glaucoma medication adherence health disparities, the results of this study should be considered in light of several limitations. First, the composition and representativeness of participants may limit the generalizability of findings. The majority of participants were representative of the southeastern region who were seeking glaucoma services from a university based medical center. A second limitation is related to the NGT technique itself that restricts the discussion

to a single topic, and may not allow further elaboration of other ideas. However, we also formed a community-based participatory research team so that we could obtain a richer understanding of the cultural perspectives of this patient population. Lastly, the findings examined barriers and facilitators related solely to AA's experiences with glaucoma medication management. Thus, we did not investigate comparisons between other racial/ethnic groups as this study was purposefully designed to follow-up to our previous research demonstrating a health disparity in glaucoma medication adherence among AA's<sup>11</sup> and to identify targets to guide the development of a health promotion intervention tailored to AA's experiences. However, future studies examining barriers and facilitators among other racial groups are warranted to determine potential differences and/or prioritization.

Despite these limitations, the NGT and input from a consumer-based participatory advisory team are valuable approaches used to uncover general and context-specific priorities in health research, particularly to guide program development in formative phases.<sup>28</sup> The current study offers such insights as voiced from the direct experiences of AA's patients themselves in terms of their glaucoma medication management. Our next step in building upon this formative research is to evaluate the feasibility and preliminary efficacy of this health promotion program, GOAL, for improving glaucoma medication adherence among AA's.

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**Table 1**

## Overview of NGT Procedural Steps.

STEP 1	<ul style="list-style-type: none"> <li>Facilitator described purpose of the study: to generate responses to two specific questions and that there would be an opportunity at the conclusion of the final step to engage in free form discussion about issues raised during the process and for elaboration of ideas/experiences.</li> <li>First question was posed to the group: “<i>What types of things make it difficult or harder for you to take your eye drop medications as prescribed?</i>”</li> <li>Participants were provided with a worksheet on which the stated question was printed with large font, and they were asked to spend 5 minutes independently generating as many words or short phrases as possible that represented their thoughts in response to the question.</li> <li>Participants were also encouraged to think about the question from the perspective of their own experiences and to avoid making any evaluative or censoring judgments that would limit the number of responses.</li> <li>Two research assistants were present to provide assistance in the process.</li> </ul>
STEP 2	<ul style="list-style-type: none"> <li>Written responses were shared with the group in a round-robin fashion.</li> <li>In a serial fashion, participants “nominated” one response from their list when it was their turn.</li> <li>They were encouraged to make their responses brief (i.e., not more than a single sentence or short phrase) and remain neutral (i.e., refrain from giving positive or negative feedback) without accompanying discussions or explanation to help avoid influencing participants.</li> <li>A staff assistant numerically listed each response verbatim on a flipchart, which was visible to participants.</li> <li>The round-robin process continued until the group was unable to provide additional responses. Individuals were encouraged to use other members’ responses to generate additional ideas they may not have considered in a round earlier when it was their turn. The round-robin process continued until the group was unable to provide additional responses.</li> <li>Lengthy responses and sidebar discussions that sometimes can occur during this step were discouraged up front when the facilitator went over the ground rules; if they occurred, they were redirected by the facilitator.</li> </ul>
STEP 3	<ul style="list-style-type: none"> <li>Each nominated response was briefly discussed for clarification.</li> <li>The intent of the discussion was to ensure that the meaning and logic of each response was understood by the group, not to evaluate or judge its merits.</li> <li>Participants were discouraged from sharing evaluative comments or opinions.</li> <li>Participants were allowed to identify what responses they considered similar or redundant. They also had the opportunity to suggest that similar responses be consolidated. Conversely, they could suggest reasons why responses should remain distinct. At no point would the facilitator presume to consolidate responses and leave it to the group to decide.</li> </ul>
STEP 4	<ul style="list-style-type: none"> <li>The fourth step consisted of a voting process that provided all participants an equal and anonymous voice in determining the relative importance of the generated responses.</li> <li>Each participant was asked to carefully look over all of the responses generated by the group on the flipchart and to identify the five most important to them in response to the question.</li> <li>Each participant recorded his/her five top responses on separate index cards.</li> </ul>
STEP 5	<ul style="list-style-type: none"> <li>Participants were asked to rank-order their five responses in order of importance to them (5 = most important and 1 = least important) by writing down the rank number on each index card (rank-order votes)</li> <li>Research assistants then gathered the index cards from the participant’s and thanked them for their effort.</li> </ul>

- The anonymous individual rank-orderings were then aggregated across participants to determine the relative importance of all responses for each group conducted.

The same steps were followed for a second question posed to each group: “*What types of things make it easier for you to take your eye drop medications as prescribed?*”

**Table 2**

## Demographic Characteristics of Focus Group Participants.

<b>Demographic Variables</b>	<b>M(SD) or n (%)</b>
Age ( <i>M/SD</i> )	65 years ( <i>SD</i> = 11.94)
Gender, <i>n</i> (%)	
Women	56 (62.9%)
Men	33 (37.1%)
Level of Education ( <i>M/SD</i> )	
Less than 12 years (no highschool degree or GED)	23 (25%.8)
Highschool degree or GED	19 (21.3%)
1 year only of college	5 (5.6%)
2 years of college / Associate degree	15 (16.9%)
3 years of college	2 (2.2%)
Bachelors degree	7 (7.9%)
Bachelors degree plus 1 year graduate coursework	2 (2.2%)
Masters degree	9 (10.1%)
Doctoral degree (PhD, MD, JD, or other)	3 (3.4%)
Missing/Unknown	4 (4.5%)
Marital Status	
Single/never married	12 (13.5%)
Married	38 (42.7%)
Divorced	12 (13.5%)
Separated	2 (2.2%)
Widowed	22 (24.7%)
Missing	3 (3.4%)
Employment Status, <i>n</i> (%)	
Retired	40 (44.9%)
Disability	17 (19.1%)
Employed Full-Time	16 (18.0%)
Employed Part-Time	7 (7.9%)
Homemaker	3 (3.4%)
Unemployed	3 (3.4%)
Missing	3 (3.4%)
Annual Household Income, <i>n</i> (%)	
Less than \$15,000	26 (29.2%)
\$15,000 to less than \$25,000	15 (16.9%)
\$25,000 to less than \$35,000	7 (7.9%)
\$35,000 to less than \$50,000	13 (14.6%)
\$50,000 to less than \$75,000	8 (9%)
\$75,000 to less than \$100,000	4 (4.5%)

<b>Demographic Variables</b>	<b><i>M(SD) or n (%)</i></b>
\$100,000 or more	3 (3.4%)
Unknown or not reported	10 (11.2%)
Missing	3 (3.4%)
Total number of chronic health conditions	5 conditions ( <i>SD</i> = 2.07)

**Table 3**

Summary of NGT Steps for Glaucoma Medication Barrier Themes, Examples, and Rank-Ordering Votes Across Focus Groups.

<b>Rank-Ordering Category Themes and Examples of Barriers Nominated Across Groups (Steps 1 &amp; 2)</b>	<b>Rank-Ordering Votes Across Groups (Step 4)</b>	<b>Sum of Rank-Ordering Votes Across Groups (Step 5)</b>
<b>Forgetfulness</b> <ul style="list-style-type: none"> <li>• “Problems remembering to take them right before going to sleep”</li> <li>• “Forgetting to take my drops, and how many drops to put in each eye”</li> <li>• “I have trouble remembering to put my drops in”</li> <li>• “I have a hard time remembering to get my prescription refilled and to put my eye drops in”</li> <li>• “Trying to remember the sequence in applying your eye drops”</li> <li>• “Forgetting to take drops with me when I go out of town”</li> </ul>	Rank 5 Sum = 95; Rank 4 Sum = 40; Rank 3 Sum = 36; Rank 2 Sum = 14; Rank 1 Sum = 6	191
<b>Side effects</b> <ul style="list-style-type: none"> <li>• “Side effects really mess with me (burning, stinging, light sensitivity, red eyes, dry eyes, tired eyes)”</li> <li>• “Side effects of headaches”</li> <li>• “When I initially put my drops in, I have to wait 30 minutes before I can really see again”</li> <li>• “I sometimes over-medicate and have dry, itchy eyes”</li> <li>• “Having drops build up in corner of eye, leaving a milky film”</li> <li>• “My eyes will burn bad in the morning after taking the drops the night before”</li> </ul>	Rank 5 Sum = 45; Rank 4 Sum = 60; Rank 3 Sum = 36; Rank 2 Sum = 24; Rank 1 Sum = 6	171
<b>Cost/affordability</b> <ul style="list-style-type: none"> <li>• “Insurance co-pays and increasing cost if you don’t have insurance”</li> <li>• “The price of the brand name versus the generic drug”</li> <li>• “Healthcare costs”</li> <li>• “My eye drops are expensive”</li> <li>• “They are expensive, and I don’t have insurance”</li> <li>• “The cost of my prescription”</li> </ul>	Rank 5 Sum = 60; Rank 4 Sum = 28; Rank 3 Sum = 6; Rank 2 Sum = 6; Rank 1 Sum = 2	102
<b>Difficulty with drop administration</b> <ul style="list-style-type: none"> <li>• “I have a hard time getting the right amount of drops out of the bottle”</li> <li>• “Trying to get my drops in my eye”</li> <li>• “It was hard for me initially to put my eye drops in, also holding my eyes open”</li> <li>• “I put too much pressure on the bottle and put too much in”</li> <li>• “The technique of putting the drops in”</li> </ul>	Rank 5 Sum = 40; Rank 4 Sum = 28; Rank 3 Sum = 18; Rank 2 Sum = 8; Rank 1 Sum = 2	96



Rank-Ordering Category Themes and Examples of Barriers Nominated Across Groups (Steps 1 & 2)	Rank-Ordering Votes Across Groups (Step 4)	Sum of Rank-Ordering Votes Across Groups (Step 5)
<ul style="list-style-type: none"> <li>• “The bottles are small, and I use the drops quickly”</li> </ul>		
<b>Eye drop schedule</b>	Rank 5 Sum = 45; Rank 4 Sum = 24; Rank 3 Sum = 6; Rank 2 Sum = 2; Rank 1 Sum = 3	80
<ul style="list-style-type: none"> <li>• “Trying to take the eye drops at the same time each day is hard for me”</li> <li>• “Not following the directions of when to take the eye drops”</li> <li>• “I get confused because of the time variation”</li> <li>• “The timing of when to put my drops in makes it harder to put my drops in”</li> <li>• “Problems falling asleep before I could take all my drops at night”</li> <li>• “Taking a lot of drops and trying to coordinate the times to take them”</li> </ul>		
<b>Low on eye drop medications</b>	Rank 5 Sum = 10; Rank 4 Sum = 8; Rank 3 Sum = 21; Rank 2 Sum = 4; Rank 1 Sum = 2	45
<ul style="list-style-type: none"> <li>• “Low on medication, taking only when needed”</li> <li>• “Not having enough of my drops &amp; staying within the timeline to purchase the medications”</li> <li>• “Staying within the time line to purchase medications”</li> <li>• “Running out of the eye drops”</li> </ul>		
<b>Lack of understanding or knowledge about eye drop medications and glaucoma</b>		
<ul style="list-style-type: none"> <li>• “When I was first diagnosed with glaucoma, I didn’t think it was that important to take the drops”</li> <li>• “Didn’t think I needed to take the drops in the beginning”</li> <li>• “Wondering if they were really working”</li> </ul>	Rank 5 Sum = 15; Rank 4 Sum = 8; Rank 3 Sum = 9; Rank 2 Sum = 6; Rank 1 Sum = 1	39
<b>Laziness</b>	Rank 5 Sum = 15; Rank 4 Sum = 16; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 2	36
<ul style="list-style-type: none"> <li>• “Being lazy”</li> <li>• “Sometimes I thought I could get away with not using the drops. Sometimes being lazy about using them”</li> <li>• “Once I get into bed, if I haven’t already taken the drops, I don’t worry about it”</li> </ul>		
<b>Being out/away or traveling</b>		
<ul style="list-style-type: none"> <li>• “Being hospitalized and not having my drops”</li> <li>• “Being out and not knowing if I need to bring it with me”</li> <li>• “Not having the drops on me at all times in case I don’t get home before the next dosage is due”</li> <li>• “Traveling and leaving my medications at home”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 20; Rank 3 Sum = 6; Rank 2 Sum = 2; Rank 1 Sum = 1	34

Rank-Ordering Category Themes and Examples of Barriers Nominated Across Groups (Steps 1 & 2)	Rank-Ordering Votes Across Groups (Step 4)	Sum of Rank-Ordering Votes Across Groups (Step 5)
<b>Quantity of drops to administer</b>		
<ul style="list-style-type: none"> <li>“Getting adjusted to taking more than 1 eye drop”</li> <li>“Quantity”</li> </ul>	Rank 5 Sum = 15; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 4; Rank 1 Sum = 1	24
<b>Being distracted</b>		
<ul style="list-style-type: none"> <li>“Distractions”</li> <li>“When my sugar is up, I forget to put my drops in”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 4; Rank 3 Sum = 9; Rank 2 Sum = 2; Rank 1 Sum = 0	20
<b>Lack of availability</b>		
<ul style="list-style-type: none"> <li>“Pharmacy does not have drops in stock that day”</li> <li>“Availability”</li> <li>“Being in an inaccessible place”</li> <li>“Having to rely on samples and not knowing if I can get the samples”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 12; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 0	19
<b>Listening to or observing others’ experiences</b>		
<ul style="list-style-type: none"> <li>“Listening to my friends at first made me scared to take my drops”</li> <li>“It made me fearful that my kids had it and it looked like the drops weren’t doing them any good, so I figured they might not work for me either”</li> <li>“I stopped taking my eye drops because a man told me my eye drops were drugs with marijuana in it”</li> </ul>	Rank 5 Sum = 0; Rank 4 Sum = 8; Rank 3 Sum = 3; Rank 2 Sum = 2; Rank 1 Sum = 1	14
<b>Communication with doctor</b>		
<ul style="list-style-type: none"> <li>“Lack of communication for the doctor”</li> <li>“Doctor told me to stop taking my drops”</li> </ul>	Rank 5 Sum = 10; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	14
<b>Contamination</b>		
<ul style="list-style-type: none"> <li>“Eye drops became contaminated”</li> </ul>	Rank 5 Sum = 10; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 0	13
<b>Busy personal schedule “Being real busy at work”</b>		
	Rank 5 Sum = 5; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	9
<b>Other health issues “Being tired and overwhelmed with other health issues”</b>		
	Rank 5 Sum = 5; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	9
<b>Changing eye medications</b>		
<ul style="list-style-type: none"> <li>“Getting used to the change of one drug to another”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	9
<b>Difficulty accepting glaucoma diagnosis</b>		
<ul style="list-style-type: none"> <li>“Hard time accepting that I had glaucoma”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 0	7

<b>Rank-Ordering Category Themes and Examples of Barriers Nominated Across Groups (Steps 1 &amp; 2)</b>	<b>Rank-Ordering Votes Across Groups (Step 4)</b>	<b>Sum of Rank-Ordering Votes Across Groups (Step 5)</b>
<b>Having to refrigerate drops</b>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 1	6
<b>Not feeling any pain</b>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	5
<b>Difficulty reading print size on label</b>		
<ul style="list-style-type: none"> <li>• “I have a hard time seeing the print on the label to know how to correctly put drops”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	5
<b>Managing other eye care issues</b>		
<ul style="list-style-type: none"> <li>• “I have to take my prosthetic eye out, clean it, and have to put drops in it also, and it makes it harder”</li> </ul>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	5
<b>Poor tracking of prescription</b>		
<ul style="list-style-type: none"> <li>• “I don’t keep track of my prescriptions and sometimes I run out”</li> </ul>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 4; Rank 1 Sum = 0	4
<b>Eye surgery</b>		
<ul style="list-style-type: none"> <li>• “It was painful to put my drops in right eye after surgery”</li> </ul>	Rank 5 Sum = 0; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	4
<b>Problems with insurance coverage</b>		
<ul style="list-style-type: none"> <li>• “The pharmacist wont’ give the brand name and my insurance only covers the generic not the brand name”</li> </ul>	Rank 5 Sum = 0; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	4
<b>Taking eye drops too often</b>	Rank 5 Sum = 0; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	4
<b>Taking steroids (prednisone)</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 1	1
<b>Having multiple eye doctors</b> “I was going to several clinics and getting too many drops”	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 1	1
<b>Thought eye drops were contributing to my headaches</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 1	1

*Note.* A maximum of up to 6 examples per theme were listed.

**Table 4**

Summary of Glaucoma Medication Facilitator Themes, Examples, and Rank-Ordering Votes Across Focus Groups.

Rank-Ordering Category Themes and Examples of Facilitators Nominated Across Groups (Steps 1 & 2)	Rank-Ordering Votes Across Groups (Step 3)	Sum of Rank-Ordering Votes Across Groups (Step 4)
<p><b>Fearing or thinking about the consequences of not taking eye drops regularly</b></p> <ul style="list-style-type: none"> <li>• “Damage to my eye if I don’t take them”</li> <li>• “I want to be around to see my wife and baby”</li> <li>• “Having to undergo eye surgery once really made me take the drops”</li> <li>• “Knowing it runs in my family and that some family have gone blind because of it”</li> <li>• “Consequences of not taking the drops (going blind, losing my vision) helps me take them”</li> <li>• “One of my eyes is already bad from glaucoma, so that makes me want to take the drops to keep the other good”</li> </ul>	Rank 5 Sum = 115; Rank 4 Sum = 36; Rank 3 Sum = 27; Rank 2 Sum = 4; Rank 1 Sum = 5	187
<p><b>Memory aids, cues, &amp; strategies</b> <i>Visual/auditory cues</i></p> <ul style="list-style-type: none"> <li>• “Keeping my eye drops in a visible place such as the nightstand, in my purse”</li> <li>• “Placing them near my toothbrush, or in plain sight”</li> <li>• “Writing myself a note and keeping it on the refrigerator”</li> <li>• “Using a timer or an alarm on cell phone set daily”</li> <li>• “I keep my drops in the bathroom near my toothbrush, so when I brush my teeth I take my drops also”</li> </ul>	Rank 5 Sum = 40; Rank 4 Sum = 64; Rank 3 Sum = 30; Rank 2 Sum = 14; Rank 1 Sum = 5	153
<p><i>Family/friend assistance</i></p> <ul style="list-style-type: none"> <li>• “My wife would call me and remind me to put my eye drops in”</li> <li>• “My husband telling me to take them”</li> <li>• “My daughter keeps all my prescriptions filled for me</li> <li>• “To be reminded by someone, makes it easier to take my drops”</li> <li>• “My granddaughter reminds me”</li> <li>• “Family reminders, my wife asking me to take them”</li> </ul>		
<p><i>Other</i></p> <ul style="list-style-type: none"> <li>• “Certain television shows cue me to take drops”</li> <li>• “Have a dresser with little shelves”</li> </ul>		
<p><b>Recognizing the importance of eye drops on eye health/knowledge</b></p> <ul style="list-style-type: none"> <li>• “I understand how important it is to take them to see”</li> <li>• “For good vision”</li> <li>• “Keeping pressure down”</li> <li>• “Learning the dangers of this disease”</li> <li>• “Having knowledge of what I need to do in terms of taking my eye drops (priority)”</li> </ul>	Rank 5 Sum = 70; Rank 4 Sum = 32; Rank 3 Sum = 15; Rank 2 Sum = 8; Rank 1 Sum = 2	127

Rank-Ordering Category Themes and Examples of Facilitators Nominated Across Groups (Steps 1 & 2)	Rank-Ordering Votes Across Groups (Step 3)	Sum of Rank-Ordering Votes Across Groups (Step 4)
<ul style="list-style-type: none"> <li>“Realizing and knowing that taking the eye drops will keep my eyesight”</li> </ul>		
<b>Keeping the same schedule/routine for eye drop administration</b>	Rank 5 Sum = 50; Rank 4 Sum = 24; Rank 3 Sum = 21; Rank 2 Sum = 16; Rank 1 Sum = 6	117
<ul style="list-style-type: none"> <li>“Taking eye drops at bedtime or first thing in the morning”</li> <li>“Organizing my time to take drops as prescribed”</li> <li>“Taking my drops at same time as my other medications”</li> <li>“Setting a schedule and sticking to it”</li> <li>“I have a ritual; a set place I keep my eye drops”</li> <li>“Timing; same time in the morning, same time at night”</li> </ul>		
<b>Being able to afford eye drops</b>	Rank 5 Sum = 25; Rank 4 Sum = 28; Rank 3 Sum = 21; Rank 2 Sum = 14; Rank 1 Sum = 4	92
<ul style="list-style-type: none"> <li>“Good insurance”</li> <li>“VA pays for my eye drops”</li> <li>“I get free samples”</li> <li>“The cost with insurance makes it easier to get them”</li> </ul>		
<b>Keeping the drops in the same area</b>	Rank 5 Sum = 15; Rank 4 Sum = 16; Rank 3 Sum = 18; Rank 2 Sum = 8; Rank 1 Sum = 1	58
<ul style="list-style-type: none"> <li>“I keep all my medicines in one place”</li> </ul>		
<b>Modifying eye drop administration</b> <i>Personal</i>	Rank 5 Sum = 25; Rank 4 Sum = 24; Rank 3 Sum = 0; Rank 2 Sum = 6; Rank 1 Sum = 1	56
<ul style="list-style-type: none"> <li>“Holding eyes open and stopped squinting and closing eyes when putting in eye drops”</li> <li>“Lying down to put my eye drops in helps control the pressure of squeezing the bottle “</li> <li>“Bending my head far back”</li> <li>“Lying flat on my back helps me use the eye drops”</li> </ul>		
<i>Family</i>		
<ul style="list-style-type: none"> <li>“My son helps me to take my drops”</li> <li>“My granddaughter helps me put my eye drops in”</li> <li>“My granddaughter picks up my prescriptions”</li> </ul>		
<i>Dosing aids (Travatan dosing aid device)</i>		
<ul style="list-style-type: none"> <li>“I had a little device with a battery that gives the drops”</li> <li>“The device made it easier for me to get the drops into my eyes”</li> </ul>		
<b>Encouragement and good communication with doctor</b>	Rank 5 Sum = 5; Rank 4 Sum = 28; Rank 3 Sum = 12; Rank 2 Sum = 0; Rank 1 Sum = 4	49
<ul style="list-style-type: none"> <li>“My doctor explained to me the importance of taking eye drops regularly”</li> <li>“Showed me pictures”</li> <li>“Detected early on by my doctor”</li> <li>“My doctor really talked with me about the background of glaucoma”</li> </ul>		

Rank-Ordering Category Themes and Examples of Facilitators Nominated Across Groups (Steps 1 & 2)	Rank-Ordering Votes Across Groups (Step 3)	Sum of Rank-Ordering Votes Across Groups (Step 4)
<ul style="list-style-type: none"> <li>• “Following doctor’s directions in terms of how/when to take drops”</li> <li>• “Glad my doctor found out I had it before it could’ve been too late.”</li> </ul>		
<b>Adjusting to taking drops</b>	Rank 5 Sum = 15; Rank 4 Sum = 12; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 0	30
<ul style="list-style-type: none"> <li>• “It was hard for me initially to put my eye drops in”</li> <li>• “It’s easier in terms of me putting my own drops in versus in the beginning when I needed someone else to help me”</li> </ul>		
<b>Taking multiple medications</b>	Rank 5 Sum = 10; Rank 4 Sum = 8; Rank 3 Sum = 6; Rank 2 Sum = 4; Rank 1 Sum = 0	28
<ul style="list-style-type: none"> <li>• “Using one eye drop for both eyes-for glaucoma and cataracts makes it easier”</li> <li>• “Having to take drops for glaucoma along with other eye drops for prosthetic eye”</li> <li>• “Putting my drops with other medications makes it easier”</li> <li>• “I take them with my other medications”</li> </ul>		
<b>Noticing improved or stable eyesight</b>	Rank 5 Sum = 15; Rank 4 Sum = 8; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 1	27
<b>Being health conscious helps me take my drops</b>	Rank 5 Sum = 20; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 0	26
<b>Keeping track on the renewal of prescriptions before eye drops run out</b>	Rank 5 Sum = 0; Rank 4 Sum = 8; Rank 3 Sum = 12; Rank 2 Sum = 2; Rank 1 Sum = 1	23
<ul style="list-style-type: none"> <li>• “Not letting prescription run out”</li> <li>• “Keeping 3 extra bottles in a small sack inside refrigerator door”</li> </ul>		
<b>Physical signs</b>	Rank 5 Sum = 0; Rank 4 Sum = 8; Rank 3 Sum = 6; Rank 2 Sum = 4; Rank 1 Sum = 1	19
<ul style="list-style-type: none"> <li>• “When my head starts to hurt I know to take them”</li> <li>• “When my eyes become blurry or irritated”</li> <li>• “At night when I’m on the computer and my eyes start running and hurting, then I realize it’s time to take my drops”</li> </ul>		
<b>Availability of my eye drops (i.e., pharmacy)</b>	Rank 5 Sum = 10; Rank 4 Sum = 8; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	18
<b>Having extra prescriptions at home and at work</b>	Rank 5 Sum = 0; Rank 4 Sum = 12; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 0	16
<ul style="list-style-type: none"> <li>• “I keep an extra bottle of my drops in my purse”</li> </ul>		
<b>Praying</b>	Rank 5 Sum = 10; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	10
<b>Staying independent</b>	Rank 5 Sum = 0; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 4; Rank 1 Sum = 1	9
<b>Controlling diabetes</b>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 4; Rank 1 Sum = 0	9
<ul style="list-style-type: none"> <li>• “The drops help me with controlling my diabetes”</li> </ul>		
<b>Other patient experiences</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 6; Rank 2 Sum = 2; Rank 1 Sum = 1	9

Rank-Ordering Category Themes and Examples of Facilitators Nominated Across Groups (Steps 1 & 2)	Rank-Ordering Votes Across Groups (Step 3)	Sum of Rank-Ordering Votes Across Groups (Step 4)
<ul style="list-style-type: none"> <li>“Observing and listening to other people about how glaucoma affects them and what makes it easier for them to take drops”</li> </ul>		
<b>Being able to drive</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 4; Rank 1 Sum = 0	8
<b>Personal choice in terms of taking the drops despite the drops making my eyes red</b>	Rank 5 Sum = 0; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 1	7
<b>Planning to do better makes it easier to take my eye drops</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 6; Rank 2 Sum = 0; Rank 1 Sum = 1	7
<b>Advertisements</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 2; Rank 1 Sum = 1	6
<ul style="list-style-type: none"> <li>“Commercials on television about going to get your eyes checked”</li> </ul>		
<b>Minimizing distractions</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 2; Rank 1 Sum = 0	5
<b>Coping with side effects</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 4; Rank 1 Sum = 1	5
<ul style="list-style-type: none"> <li>“After my eyes are not blurry, I can see very well”</li> </ul>		
<b>Numbering eye drop bottles so that I can take them in sequence</b>	Rank 5 Sum = 5; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	5
<b>Remembering back to the onset of my glaucoma</b>	Rank 5 Sum = 5; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	5
<b>Minimizing side effects</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 1	4
<ul style="list-style-type: none"> <li>“If I don’t put my drops in my eyes, they’ll turn red; my eyes turn red if I don’t take them”</li> </ul>		
<b>Keeping colored tops and colored bottles</b>	Rank 5 Sum = 0; Rank 4 Sum = 4; Rank 3 Sum = 0; Rank 2 Sum = 0; Rank 1 Sum = 0	4
<b>Carrying medications when traveling</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 2	4
<b>Thinking of famous African Americans with vision loss as a motivation</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 0	3
<ul style="list-style-type: none"> <li>“I think of Ray Charles as a little boy”</li> </ul>		
<b>Staying with the same doctor</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 3; Rank 2 Sum = 0; Rank 1 Sum = 0	3
<ul style="list-style-type: none"> <li>“Having the same doctor-keeping doctors consistent”</li> </ul>		
<b>Having to refrigerate drops</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 0	2
<ul style="list-style-type: none"> <li>“Refrigerating my drops helps me take them”</li> <li>“Keeping eye drops separate from other eye drops in the refrigerator”</li> </ul>		
<b>Separating medications</b>	Rank 5 Sum = 0; Rank 4 Sum = 0; Rank 3 Sum = 0; Rank 2 Sum = 2; Rank 1 Sum = 0	2
<ul style="list-style-type: none"> <li>“I keep the eye drops separate from the other eye drops-in the refrigerator”</li> </ul>		

Note. A maximum of up to 6 examples per theme were listed.

**Table 5**

Overview of the Health Promotion Program (GOAL: *Glaucoma Management Optimism for African Americans Living with Glaucoma*) Goals for Each Session.

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**In-Person Session 1**

- Build trust and rapport
  - Provide rationale/purpose for the program and importance of glaucoma medication management
  - Introduce the structure of sessions
  - Administer a brief quiz about glaucoma knowledge using the *Glaucoma Eye-Q Test* from the National Eye Health Education Program (NEHEP, 2006)
  - Discuss barriers related to glaucoma medication management; prior attempts and successes or failures to overcome such obstacles
  - Address fears and/or inaccurate perceptions of glaucoma and its management with medications
  - Provide general glaucoma education and its management by reviewing educational resources: “*Understanding and Living with Glaucoma*” and “*African Americans and Glaucoma*” published by the Glaucoma Research Foundation; “*Glaucoma: What you should know*” published by the National Eye Institute (NEI); and the “*Glaucoma Medication Management Workbook and Worksheets for African Americans*” developed by the community-based participatory research team
    - Topics include: understanding glaucoma, symptoms, management, strategies for communicating with eye care providers and questions to ask, importance of medication adherence
  - Conduct MI techniques to evaluate readiness to change adherence behaviors and confidence in adhering (i.e., expressing empathy, rolling with resistance, developing discrepancies, supporting self-efficacy)
  - Begin to help participant brainstorm on how these barriers related to management and adherence to glaucoma medication can be overcome by learning strategies from the health promotion program
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**Phone Session 2**

- Review information from session 1
  - Review readiness to adhere to glaucoma medications and confidence for coping with barriers
  - Review barriers and facilitators experienced by African Americans using the *Glaucoma Medication Management Workbook for African Americans*
  - Introduce the problem-solving model and principles that can be applied to the management of chronic medical conditions such as glaucoma as well as other life problems (i.e., caregiving for grandchildren, financial difficulties, relationship problems, etc.)
  - Provide an overview of problem-solving technique; work with the participant to develop a plan to adhere to glaucoma medications; and work through problem-solving skills
    1. Review & reinforce MI techniques for challenging any negative problem orientation to medication adherence
    2. Define and break down the problem (e.g., participant forgets to take medications); help participant to establish realistic goals
    3. Generate multiple solution alternatives: Help subject brainstorm as many potential solutions as possible Remind participant that the purpose is not to judge solutions but to just brainstorm all possible solutions (e.g., place glaucoma medications near other medicines, set a timer/alarm as a reminder, ask spouse to remind the subject, place a post-it-note, integrate taking glaucoma medications with other daily morning/evening routines [e.g., brushing teeth])
    4. Decision-making After going through a process of weighing pros and cons to each potential solution, participant will select one to implement over the course of the next week (e.g., subject will place a post-it-note on bathroom mirror)
    5. Solution implementation and evaluating the outcome At the next phone session the participant will share her experiences of the solution he or she selected (e.g., placing the post-it-note on the bathroom mirror)
  - Continue to address fears and/or inaccurate perceptions of glaucoma and its management with medications
  - Continue to apply MI techniques to build readiness for change, confidence, and plan for action
  - Assign homework based on problem solution
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**Phone Sessions 3**

- Review homework assignment from previous phone call
- Determine whether subject experienced success in implementing solution from previous phone call (e.g. placed post-it-note to bathroom mirror)



- If yes, problem-solve barriers to other glaucoma medication management activities (e.g., side effects, beliefs about the impact of medication on health, costs)
- If no, evaluate and revise plan developed in previous phone session. Identify aspects of the plan that were unrealistic
- Problem-solve barriers to adhering to medications
- Address fears and/or inaccurate perceptions of glaucoma and its management with medications
- Continue MI techniques to build motivation and confidence for managing barriers/obstacles

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**Phone Sessions 4**

- Review homework assignment from previous phone call
  - Review problem-solving model and application
  - Continue MI techniques to foster continued motivation and confidence for managing barriers/obstacles and to utilize health promotion resources in the future
  - Discuss relapse prevention: strategies to maintain success and/or how to handle setbacks to prevent relapse into ineffective glaucoma medication adherence
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