

Darren Knight
McNairs Summer Research Institute
July 24, 2009

Relationship between Patient Satisfaction and Potential Compliance With Glaucoma Treatment amongst African Americans

ABSTRACT

Glaucoma is an ocular disease that leads to the degeneration of retinal ganglion cells. In the chronic version of glaucoma, lack of pain creates patients that are often unaware that their eyesight has begun to deteriorate. They remain unaware of their condition until they suddenly lose their sight due to leaving the disease untreated. Even when glaucoma is diagnosed, a considerable number of patients suffer blindness due to treatment noncompliance. African Americans suffer from glaucoma at a higher rate than whites and noncompliance is a possible cause of this gap. The study analyzed the relationship between patient satisfaction and potential compliance with glaucoma treatment by administering surveys to African American patients over the age of forty. The survey questions focused on finding a relationship between patient satisfaction and compliance with glaucoma treatment. The study found that a large portion of the participants cited the importance of the length of treatment and provider's experience in complying with a primary healthcare provider. Participants consistently mentioned the importance of a provider's qualities and skill, but many noted that the price of a consultation could override other factors. Interestingly, the importance of price remained consistent amongst patients from different income ranges. These results imply that the high incidence of glaucoma induced blindness between African Americans and other races could be decreased through interventions targeting the cost of care. Eliminating or decreasing the concerns of medication costs could very likely improve compliance rates, rather than focusing solely on patient satisfaction.

INTRODUCTION

Humans have five senses that elegantly work together to help us to operate in the world. Vision is arguably one of the most important senses and blindness leaves thousands of Americans without this crucial ability. In the United States, glaucoma is an ocular disease that is one of the leading causes of blindness and it has increasingly left many Americans without the ability of sight at an earlier age. The slow progression of glaucoma causes many people to leave themselves untreated and thus, more susceptible to blindness. The problem is further complicated as a number of factors have been linked to the problem of lowering the rate of glaucoma complication. One of the biggest threats is the challenge presented by patients who will not comply with the prescribed treatment. This is an enormous problem since treatment can help prevent the disease's progression to blindness. Even after diagnosis with glaucoma, a significant number of people still choose not to follow through with prescribed treatment.

Another challenge presented by glaucoma stems from its disproportionate effect on African Americans. In particular, African Americans suffer from glaucoma and glaucoma related blindness at rates much higher than those of Whites living in the United States. They also have higher rates of noncompliance with glaucoma treatments and lower rates of diagnosis. A number of factors can be linked to the imbalance between African Americans and other groups. There are a number of risk factors that contribute to glaucoma's higher prevalence amongst African Americans, diabetes and hypertension in particular affect this group at a higher rate and leave them more susceptible to glaucoma related blindness (Blake 1952). With such high rates of incidence amongst Americans, glaucoma will continue as one of the biggest threats to ocular health in the United States.

PURPOSE STATEMENT

The rates of glaucoma related blindness are six times higher amongst African Americans who have been diagnosed with the disease. It is the leading cause of blindness amongst African Americans in the United States and is further complicated by the disease's link to diabetes; African Americans are also more susceptible to diabetes, a leading risk factor for contracting glaucoma (Ontoso 1997). The focus of glaucoma research has been aimed at various factors such as compliance, surgical intervention, and screening. My research will focus on the relationship between patient satisfaction and potential compliance with glaucoma treatment. The importance of the doctor- patient relationship is unquestionably important and its potential relationship with compliance could be an important finding. The surveys will identify whether a relationship can be established between the two factors, as well as seek to identify factors that might help improve compliance amongst African American patients. A positive relationship between patient satisfaction and compliance could indicate that this is the first point of interest in the search to improve compliance. These results can also help to decrease the high rate of noncompliance amongst African Americans, since treatments methods can become focused on a number of concerns that were consistently mentioned as causes of noncompliance.

If a relationship can be established between patient satisfaction and compliance with physicians, interventions could focus on these areas to improve health outcomes. Since it has been shown that African Americans comply with treatment at a lower rate than patients of other races, improving compliance provides a solution. Research on this subject will provide guidance for physicians who have struggled to overcome noncompliance amongst their African American patients.

Further implications of this study will focus on the importance of other factors in influencing patient compliance with glaucoma treatment. The survey will indicate that factors

such as price or length of treatment also play a significant role in the rate of compliance amongst African Americans.

LITERATURE REVIEW

Glaucoma is a name for any condition where the internal pressure of the eye is abnormally high. The exact pathway of glaucoma is very complex, but the primary cause has been determined to stem from increased pressure. There is also evidence that glaucoma prevalence can be associated with the African American Race (Blake, 1952; Wormald, 1994). In other studies evidence has also been produced linking the disease with the Hispanic race as well (Sharts-Hopko, 2009). In recent times it has become apparent that glaucoma and intraocular eye pressure (IOP) are not synonymous, rather IOP is a major risk factor for the disease. For a number of years it was thought that the presence of high IOP was a direct cause of the disease glaucoma. In fact, glaucoma can be caused by a number of different factors: high IOP is just one of the highest risk factors for the disease (Ontoso, 1997). After a study showed that nearly 35% of patient suffering from glaucoma may not experience any form of IOP, the definition for glaucoma was altered.

There are two main forms of the disease glaucoma, the open angle/chronic form and the closed angle/acute form. The open angle form of the disease has been associated with all of the previously stated risk factors and has also been linked to other diseases such as diabetes and hypertension (Ontoso, 1997). Open angle is the most frequently contracted form of the disease and is also the most dangerous type. It is defined as, “a chronic, slowly progressive, multifactorial, usually bilateral, though not necessarily symmetrical, optic neuropathy. It is characterized by atrophy and cupping of the optic nerve head, resulting in a distinctive pattern of visual defects (Zimmerman, 2001).” The dangers of open angle glaucoma stem from its slow progression and the damage it causes to a patient’s peripheral vision as well as the eventual cause

of blindness. Since the disease progresses so slowly, patients often progress without experiencing any symptoms of the disease (Ontoso, 1997).

There are two forms of the angle closure form of glaucoma, primary and secondary. Primary is defined as, “apposition or adhesion of the iris to the trabecular meshwork as a result of crowded anterior segment anatomy in a predisposed eye.” When a patient is diagnosed with the angle closure form of glaucoma, they must be treated through surgical measures (Zimmerman, 2001). These surgical measures can include filtration surgery, as Dr. Alan Koker states, “in recent decades, trabeculectomy, which involves removal of a block of limbal tissue beneath a scleral flap, has gained wide acceptance as an effective pressure-lowering procedure that minimizes the complications common to the earlier full thickness technique” (Morrison, 2003). The treatment for chronic glaucoma, the focus of this research project, is much more complicated by the disease’s multifaceted nature.

In response to the progression of the chronic form of glaucoma in patients, doctors often prescribe medication that attempts to lower the person’s IOP. The effectiveness of the treatment is limited because of glaucoma’s limited relationship with the incidence of high ocular pressure. Since the relationship is limited, treatment is often only administered to patients who show an extremely high IOP. It has been documented that these treatments have shown a high success rate in lowering the value of a patient’s IOP, but serious study has not been done on the effectiveness of this treatment in relation to glaucoma (Ontoso, 1997).

Glaucoma treatment is complicated because there are six different classes of anti-glaucoma drugs, each with over 20 medications in every category. This has led to a personalized treatment being created for individual patients. To determine the best medication for an individual, doctors will have patients undergo “one eye trials” until the desired IOP is

reached (Zimmerman, 2001). As each patient moves between the different trials, the doctor will focus on one eye and adjust the medication accordingly. Every medication has about an 80% chance of succeeding in each individual patient. Since these medications have been found to be so effective, the most significant barrier to successful treatment of glaucoma stems from compliance issues (Zimmerman 2001). Patient noncompliance is a serious issue in regards to health because the eye disease is the third most common cause of blindness in America. A study done on a cohort ranging from 65 and older that took part in a New Jersey Medicaid program showed a high level of noncompliance (Gurwitz et al., 1998). Noncompliance is a serious issue amongst all patients suffering from glaucoma; minority patients suffer from the disease at a much higher rate and are thus more susceptible to experiencing complications of leaving the disease untreated.

My study will focus on those compliance issues as they relate to minorities, in particular African Americans, undergoing treatment for the chronic/open angle form of glaucoma. According to recent studies, African Americans had a prevalence rate three times that of their white counterparts. Hispanics had a prevalence rate that was intermediate to that of blacks and whites (Friedman, 2004). Recently a study showed the link between the onset of diabetes and the diagnosis of glaucoma amongst Hispanics living in Los Angeles. Since Hispanics are one of the fastest growing minority groups in the United States, it is vital that research continues to focus on the best methods of conducting successful screenings for eye disease. Discoveries such as these are the first steps towards eliminating the large barriers that exist between different ethnic groups in the United States.

African Americans are the least likely to get screened for the disease. African Americans are also highly susceptible to diabetes, a risk factor for contracting glaucoma. As research has

found “Studies have consistently shown that approximately one third of people with diabetes have not had an eye examination in the previous 2 years. In addition, African-Americans have fewer eye examinations than do whites, despite African-Americans’ increased prevalence of glaucoma and diabetes” (Elish et al., 2007). The study looked at the motivations that prevented African Americans from pursuing screenings or treatment for their eye condition. Many of them stated that they felt screening should be pursued upon experiencing problems with their eyesight (Elish et al., 2007). These results mirrored the results of another study the attitudes of African American patients who needed screening for blindness associated with diabetes. The study assessed African American patients’ knowledge and health beliefs through the use of telephone surveys. The study indicated that African American patients avoided testing because of a lack of understanding of the risks involved in not seeking out eye screenings (Walker et al., 1997).

Another aspect of patient treatment that I have chosen to study involves the effect of patient’s satisfaction with physicians on the decision to comply with treatment. It has already been shown that patients are more likely to follow treatment for glaucoma as their individual knowledge of the condition increases (Hoevenaars, 2008). This approach focuses on the process of increasing people’s knowledge of glaucoma in order to increase the rate of compliance. Study by the Wilmer eye institute in Baltimore stated, “These findings indicate that doctor-patient communications and health-related beliefs of patients contribute to patient adherence” (Friedman et al., 2008). The study demonstrated the importance of a physician’s relationship with his patients in determining whether a patient will follow through with a given treatment. The study also found that patient’s race was a common factor amongst the patients who chose to ignore the directions given by physicians (Friedman et al., 2008). Another factor that has played a slight role in improving compliance amongst all patients is the use of the fixed combination of timolol-

dorzolamide. This particular medication used to treat high IOP has been shown to reduce the likelihood of noncompliance amongst patients. This probably stems from the relatively simple application of the medication by patients who have been affected with glaucoma. In the words of Robert Fechtner, MD, professor of ophthalmology, Institute of Ophthalmology and Visual Science, New Jersey Medical School-UMDNJ, “The more complex we make it for patients, the less likely that they will be successful” (Groves, 2004).

In examples of noncompliance amongst people facing other diseases that do not always create recognizable symptoms, such as hypertension, the rates remain similar. Amongst patients with hypertension the causes of noncompliance are varied and cannot be pinpointed into one particular cause. This example has also been shown amongst inner city patients who required life saving chemotherapy treatments in order to survive (Lebovits et al., 1990). The consistency of noncompliance amongst various diseases indicates that the best focus for research should be on factors outside of purely socioeconomic status and race. The next investigation into patient noncompliance with glaucoma should be directed toward psychosocial factors that can affect the decision to follow the directions of others.

Compliance has not often been shown to be linked to the satisfaction and quality of communication within the doctor patient relationship. A number of studies have attempted to explain compliance in terms of psychological theories. The usage of social learning theory as well as expected value theory indicates that people’s basic perception of health and health care are expressed in their beliefs and attitudes and are reflected in healthy related behavior.

Researchers have used two particular models to demonstrate good predictive validity and the Health Belief Model (Wolfe, 1984). One particular aspect of the health belief model identifies the patient’s satisfaction with the treatment received as an indicator of the likelihood of

compliance. Since patients who suffer from chronic disease have been in treatment from some time, demonstrating that cognitive variables cause health behavior is difficult (Wolfe, 1984).

The role of attitudes and perceptions in relation to health decisions has remained a topic that deserves further investigation. Based on pure reasoning, people should always be willing to follow a life sustaining process of treatment. Until recently, this field of research was also dominated by cognitive models in which heuristics and biases were proposed to explain why decisions are not always based on a rational consideration of the costs and benefits (Tversky & Kahneman, 1974). As Latton states, “Research into affect focused not on the affective response to the behavior or decision itself but rather on the extent to which mood (whether the participant was happy or sad) influenced decision making” (Lawton et al., 2009). This new focus of research on the role of attitudes and perception in harmful decision making plays directly into the dangerous behavior of some glaucoma patients. As these patients decide to ignore the directions of physicians they continue to put themselves at a greater risk for the progression of their glaucoma into blindness. My study will focus on how people perceive that their attitudes and perceptions about their physicians will influence their decision to follow up with glaucoma treatment.

Other works go into further detail on the importance of the doctor- patient interaction in prediction of compliance and treatment for chronic disease. Patient satisfaction has been shown to be the best measurement of the doctor- patient relationship (Kaplan et al., 1989). Dissatisfied patients have been shown to be more likely to noncompliant with medical recommendations (Kaplan et al., 1989). The doctor is automatically placed in a position that implies power and influence amongst their patients. Patients rely on doctors to explain their healthcare and to interpret their individual health status (Kaplan et al., 1989). Oddly it has also been shown that

many patients who are highly satisfied with their doctors still demonstrate negative relationships in regards to compliance. This is an ironic result that demonstrates the need for a better form of measurement in the doctor- patient relationship. At the conclusion of the study no definitive conclusions could be made in regards to the relationship between patient's attitude towards doctors and their compliance with treatment (Kaplan et al., 1989).

In a number of studies it has been shown how important patient satisfaction with a physician in influencing treatment outcomes. In the mental disorder of schizophrenia, patients have been shown to be much more likely to follow through with psychiatric treatment if they feel included in the healthcare process (Chue, 2006). Schizophrenia patients were used as an example of a possible link between patient satisfaction and treatment outcomes because of a lack of information on glaucoma patients. This is an aspect that must be further studied because of the possible effects it could have on glaucoma patient's outcomes. The possibility that patient satisfaction studies could identify ways to increase the compliance amongst African Americans with glaucoma is an invaluable resource that we cannot afford to overlook.

METHODS AND RESEARCH DESIGN

Sample/ Participants

The participants in my research on glaucoma were thirty-one African Americans from the Los Angeles County area, in the age range of forty and older.

Participants will be asked to identify their racial background as part of the questions on the survey. The Los Angeles County area has been chosen because its location is easily accessible from the USC undergraduate campus where the study will be conducted. This will also provide a sense of legitimacy amongst potential participants when asked to complete a survey as part of the research.

The participants were recruited through solicitation by the primary researcher and by word of mouth. The participants were made aware of any inconveniences that they would incur by taking the survey and no compensation was given. There will not be any identifiable information collected by my research. The research will be approved by the USC main campus IRB committee after they have completed their review of the research process.

Measures

This study will utilize surveys in order to collect participant's answer to questions designed to assess their level of satisfaction with the treatment they receive from physicians. Many questions will also try to assess other aspects of compliance with patient care that might provide new information. These aspects will include patient's average income as well as whether they have a primary physician who they rely on for treatment. The surveys will contain between twenty- one questions so as not to become too large of an inconvenience for participants. The questions have all been designed to assess the relationship between patient satisfaction and potential compliance with glaucoma treatment through the use of questions that ask participants to choose their opinion on a five figured scale. The survey questions were largely based on questions designed to identify failure to follow up with glaucoma treatment amongst African American patients (Gwira et al., 2006). The patients will be asked their answer to certain questions based on how strongly they disagree or agree with the given statement.

The survey will also contain a couple quantitative questions in order to gain a deeper understanding of the factors that affect a person's decision to comply with treatment. The surveys were largely based off of another survey administered to a similar patient population. The surveys were designed to include some socioeconomic factors such as smoking and access to a car in order to establish the general affect of this factor on participants involved in the study.

The surveys created for this study aimed to assess participant's value of various aspects of patient care. Other quantitative questions aimed to evaluate the importance of certain characteristics in choosing a primary physician. The questions looked at the importance of race, age, experience, and other factors that participants might list as important

Later questions will ask about factors that limit participant's decision to follow treatment. They will be qualitative questions where participants will have an option to choose a response entitled other. This response will have a line that will allow them to write any further opinions that influence them. While taking the survey people frequently wrote opinions on topics that possessed questions with no area for response. They would oftentimes share their opinions vocally, so these thoughts and opinions were recorded in an effort to gain more information.

Statistics

The data will be analyzed with correlation tests as well as the percentages of similar answers will be presented in order to make conclusions that can be applied to the wider population of African Americans across the United States. The statistical data will be included in the discussion and conclusion sections for the research conducted.

The computer program Excel was used to organize the data recorded from the paper surveys. The statistical program Excel, SPSS 13.0 was used to analyze averages, on descriptive statistics, standard deviation, and pearson correlations between patient satisfaction and compliance.

Results

The survey participants were all African Americans over the age of forty. Out of those participants 71% had a college or graduate degree, and only 3.2% stated that they only have some high school education. The study was made up of 17 males and 14 female participants with a mean average of 53.3 years of age. Only one of the participants had been previously

diagnosed with glaucoma. The majority of the participants indicated that they do not smoke 90.4%, and a significant portion of them did not consider themselves alcohol drinkers 32.3%.

Only 9.6% of the survey participants stated that they did not have a physician that they saw on a regular basis.

When the data was analyzed for Pearson correlations between the aspects of income and price it produced no significant results. A correlation was determined between income and previous knowledge of glaucoma, ($r=0.507$ $p=0.004$). A positive correlation was also established between participant's previous knowledge of glaucoma with their likelihood to comply with treatment for a disease that was not glaucoma, ($r=0.541$ $p=0.002$). A negative correlation was determined to exist between travel and income, ($r=-0.529$ $p=.002$). Interestingly, a positive correlation was also established between the importance of price of treatment and a physician's personal qualities, ($r=0.451$ $p=0.011$).

The short answer questions on the survey produced a number of important observations. Many wrote about the significance of price and its ability to overrule other factors involved in their care. They often noted that for a reasonable price they would be willing to deal with substandard care. Another data trend focused on the questions about the importance of their physician's race in helping choose a physician. Many participants, particularly the older ones noted that they believed a physician's race was an important factor. Some of them indicating that they believed they would receive better treatment from physicians of a particular race or ethnicity. Others noted that they would feel more comfortable with a physician who was of the same race or ethnicity. Another noteworthy trend in quantitative data stated that the people's compliance was based mostly on their general perception of their doctor. The higher esteem they have for the physician, the more likely they are to comply and trust in his opinions. Other

participants pointed to the difficulty of eye drops and other aspects of eye care in limiting their compliance.

Discussion

Many of the initial questions highlighted the demographics of the population that was being surveyed. The test showed that the tests would have some inherent bias because the majority of people indicated that they had either a college degree or graduate degree. This brought in the statistic that as people become more educated they are less likely to suffer from a number of different diseases. This factor also skewed the data away from the concept of matching the survey participants with the demographics of the Los Angeles area. The surveys were also collected from participants as they left a large church. It was an interesting to note that a majority of the participants were able to use a car to arrive at their eye exam. Since the sample contained only one participant who had been diagnosed with glaucoma, not blind, the participants had reasonable eye health and were able to drive to the exam. These aspects probably played almost no role in compliance's relation to patient satisfaction.

The participants' responses to the set of question designed to indicate the importance of certain factors in choosing a primary care physician produced mixed results. After analyzing the results of the data it became clear that certain factors such as years in practice and friendliness were consistently listed as either important or very important. The importance of these factors is not very likely to be argued. It matches up with many of the elaborate responses participants mentioned during question 10. A number of the short answer questions spoke about the importance of physician's friendliness and a general perception that the doctor was knowledgeable. Many listed that if their doctor was knowledgeable and experienced, noncompliance would never become an issue. Some people commented that this was a result that would be consistent irrespective of the physician's race.

Despite the fact that no direct correlations could be drawn between race and compliance, many of the participants noted its importance in their comments. While passing out surveys participants routinely expressed their opinions on healthcare vocally. Many of them would even write comments in the margins of the document. As I was reading this qualitative data I could not overlook the trends in the data. Oftentimes the comments would be very similar, irrespective of the participant's age or income. This data makes clear the mitigating factors that had to be including in the final data analysis.

The majority of the people indicated that they rate their clinicians as skilled or highly skilled. This rating indicated that the large majority of survey participants considered their physicians as competent providers who had been properly trained. This aspect of the population shows that a large majority of the participants would consider themselves satisfied with their doctor. These questions were used to assess participant's satisfaction with their doctor, but throughout the research participants indicated that price was their biggest barrier to seeking treatment. These results showed that price might actually have a role in compliance. The qualitative data reiterated this concept, quotes such as "I don't care if I can afford the payments," indicates that the price of treatment is a significant concept.

The few comments that mentioned the difficulty of completing treatment that makes use of eye drops is a factor that deserves further investigation. Patients who struggle to take eye drops will be viewed as noncompliant even if they intend to take part in the treatment. In particular, elderly patients often have trouble applying eye drops due to an inability to use steady hands. Future studies on eye care should seek to establish application methods that will simply treatment for seniors. The survey indicates that most people have a strong interest in their healthcare, and very few would simply ignore the possibility of blindness. This aspect provides

strong evidence for the presence of other factors that work to limit compliance amongst African Americans in particular.

Conclusion

After completing the study, the results did not show a correlation between any of the participant's answers regarding choosing a primary physician and compliance. This suggests that the participants did not base their compliance on qualities such as friendliness, years in practice, age, race, or school of graduation. Although only 25.9% of participants listed race as an unimportant factor in choosing their physician, no direct correlation could be drawn after running the data. Participants often indicated that they would follow treatment if they felt it was necessary and the physicians appeared competent. When asking participants about factors they often indicated that they felt price was the most important aspect of their treatment. If they could afford healthcare they would be more inclined to seek and follow treatment directives.

Interventions with the goal of improving the statistics on glaucoma related blindness amongst African Americans must focus on factors such as price and access in order to improve the rate of compliance. The only other factor that was identified by the study as a significant aspect of compliance was price of treatment. The dramatic gap between African Americans and other races in regards to glaucoma is a complicated fact that will require further research in order to be overcome. Future research will employ a larger sample of people and will develop a survey that puts more emphasis on the importance of price in determining compliance with glaucoma treatment.

The study was limited by the particular participants who were willing to complete the survey. The majority of the participants were solicited near a large church that contained a primarily African American constituency. This created a possibility of bias amongst those that completed the survey in that they were primarily religious people. These might have skewed

data collected from those that completed the survey at that particular location. Also, the participants might have hurried through the survey due to the high temperature recorded on that particular Sunday. They might have felt pressured while completing the survey in front of members of the research team. This introduced another possibility of bias into the study.

Other participants might have answered questions without thinking about their answers because of the length of the survey. Many surveys had to be thrown out because participants were unwilling to read through the entire document. Additionally, older participants sometimes requested that the surveys be dictated to them because they did not have their corrective eyewear. The process of reading the surveys left open the possibility of bias in participant's responses to questions. Some participants might have responded to unconscious verbal cues produced by the researcher.

IMPLICATIONS

Some of the implications that result from noncompliance with a physician's directives for treatment involve an increased risk for fully developed glaucoma and the side effect of blindness. When patients ignore a doctor's directives they fail to slow down the damage in their eye and allow themselves to progress towards blindness at a much faster rate. If research can identify a link between African American's perception of their physicians and noncompliant behavior, new protocols can be developed to eliminate the prevalence of this behavior. Lowering the frequency of noncompliant behavior will help to lower the frequency of glaucoma induced blindness amongst African Americans. With rates that are three times higher than those of white patients, African Americans are plagued by the damages of noncompliance at an alarming rate. Research on the causes of noncompliance amongst patients may lead to future changes in the organization of treatment for patients and thus result in lower rates of glaucoma amongst African Americans.

Other implications of the study involve the presence of some overriding factor that leads African American patients to avoid following treatment directives at a rate higher than that of whites. The results of this study could lead to a new understanding of the causes of different prevalence rates and perhaps help in the creation of a focused method of treating minority patients on a larger scale. It is important that future studies focus on other factors that lead to a decreased rate of participation, because the possibility remains that the difference in prevalence rate stems from factors outside of culture and attitudes. There is a strong chance that there are numerous circumstances that come together to effect the rate of glaucoma amongst African Americans. Future studies will continue to address these issues and investigate possible prevention methods.

Works Cited

- Blake, Eugene M. "Glaucoma." *American Journal of Nursing* 52 (1952): 451-52. Print.
- Chopra, Vikas. "Type 2 Diabetes Mellitus and the Risk of Open Angle Glaucoma: the Los Angeles Latino Eye Study." *Ophthalmology* 115.2 (2008): 227-32. Print.
- Chue, Pierre. "The relationship between patient satisfaction and treatment outcomes in schizophrenia." *Journal of Psychopharmacology* 20.6 (2006): 38. Print.
- Ellish, N. J., R. Royak-Schaler, S. R. Passmore, and E. J. Higginbotham. "Knowledge, attitudes, and beliefs about dilated eye examinations among African-Americans." *Invest Ophthalmol Vis Sci* 0548.5 (2007). Print.
- Friedman, D. S., and Et al. "Prevalence of Open Angle Glaucoma among adults in the United States." *Arch Ophthalmol* 122.4 (2004): 532-38. Print.

- Friedman, D. S. "Doctor-patient communication, health-related beliefs, and adherence in glaucoma results from the Glaucoma Adherence and Persistency Study." *Ophthalmology* 115.8 (2008): 1320-327. Print.
- Groves, Nancy. "Fixed-combination drug beneficial in glaucoma therapy: additional reduction in IOP, enhanced patient compliance are plus factors. (A valuable option)." *Ophthalmology Times* 29.2 (2004): 30. Print.
- Gurwitz, Jerry H., Susan M. Yeomans, Robert J. Glynn, Barbara E. Lewis, Raisa Levin, and Jerry Avorn. "Patient Noncompliance in the Managed Care Setting: The Case of Medical Therapy for Glaucoma." *Medical Care* 36 (1998): 357-69. Print.
- Gwira. "Factors Associated with Failure to Follow Up after Glaucoma Screening." *Ophthalmology* 113.8 (2006): 1315-320. Print.
- Hoevenaars, J. G., J. S. Schouten, B. Van Den Borne, and C. A. Webers. "Will improvement of knowledge lead to improvement of compliance with glaucoma medication?" *Acta Ophthalmol* 86.8 (2006): 849-55. Print.
- Kaplan, Sherrie H., Sheldon Greenfield, and John E. Ware. "Assessing the Effects of Physician-Patient Interactions on the Outcomes of Chronic Disease." *Medical Care* 27.3 (1989). Print.
- Lawton, Rebecca, Mark Conner, and Rosemary McEachan. "Desire or reason: Predicting health behaviors from affective and cognitive attitudes." *Health Psychology* 28.1 (2009): 56-65. Print.
- Lebovitz, Allen H., James J. Strain, Steven J. Schleifer, Jeffrey S. Tanak, Sushil Bhardwaj, and Madeline R. Messe. "Patient Noncompliance with Self- Administered Chemotherapy." *Cancer* 65.1 (1990): 17. Print.

Morrison, John C. *Glaucoma: A Clinical Guide*. New York: Thieme Medical, 2003. *Ebrary*.

Web. 24 July 2009.

<<http://http://wf2dnvr8.webfeat.org:80/lb4vL12606/url=http://site.ebrary.com/lib/uscisd/Doc?id=10126320&ppg=473>>.

Ontoso, Ines A., Francisco G. Grima, Enrique A. Ontoso, and Luis R. Fernandez. "Does Treatment of Mild Intraocular Hypertension Prevent Glaucoma?" *European Journal of Epidemiology* 13 (1997): 19-23. Print.

Quigley, H. A. "Number of People with Glaucoma Worldwide." *British Journal of Ophthalmology* 80 (1996): 389-93. Print.

Sharts-Hopko, Nancy C., and Catherine Glyn- Milley. "Primary Open Angle Glaucoma." *American Journal of Nursing* 109 (2009): 40-49. Print.

Tong Nagy, Vivian, and Gary R. Wolfe. "Cognitive Predictors of Compliance in Chronic Disease Patients." *Medical Care* 22.10 (1984): 912-21. Print.

Tversky, A., and D. Kahneman. "Judgment under uncertainty: Heuristics and biases." *Science* 185 (1974): 1124-131. Print.

Walker, Elizabeth A., Charles E. Basch, Crystal J. Howard, and Patricia A. Zybert. "Incentives and barriers to retinopathy screening among African-Americans with diabetes." *Journal of Diabetes and Its Complication* 11.5 (1997): 298-306. Print.

Wormald, R. P., E. Basauri, L. A. Wright, and J. R. Evans. ". The African Caribbean Eye Survey: risk factors for glaucoma in a sample of African Caribbean people living in London." *Eye* 8 (1994): 315-20. Print.

Zimmerman, Thomas J., and Karanjit Kooner. New York: Thieme Medical Incorporated, 2001. Print.