

Association of Strength of Religious Adherence with Attitudes regarding Glaucoma or Ocular Hypertension

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Key Words

Glaucoma · Quality of life · Religious adherence · Religion

Abstract

Background: To evaluate the impact of religious adherence on a patient's outlook on disease in a glaucoma population. **Methods:** A prospective survey analysis of patients with open-angle glaucoma or ocular hypertension evaluating self-reported global religious adherence, adherence to specific basic activities and knowledge of faith ('maturity') and 'comfort' (ability to cope, attitude toward glaucoma, motivation to take medication and God's concern). This specific analysis was limited to self-professed Christians. **Results:** 248 patients were included and religious adherence was correlated to religious activity and knowledge ($p < 0.0001$). Patients who scored as adherent on at least 1 of 4 maturity questions had greater benefit than less adherent patients from each of the 5 comfort questions ($p < 0.0001$). We found an increased statistical separation on each of the 5 comfort questions between religiously adherent and less adherent individuals for patients who scored as adherent on any 2 ($n = 40$), 3 ($n = 50$) or all 4 ($n = 57$) of the maturity questions ($p < 0.001$). **Conclusions:** This study suggests, at least for the Christian faith, that religious patients are subjectively

more prone to cope with treatment and that religiosity increases the self-confidence, and possibly the quality of life, of patients with glaucoma or ocular hypertension. Whether this necessarily translates into better glaucoma practices remains to be demonstrated by further studies.

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A growing number of studies suggest a connection between religion and both mental and physical health [1–3]. Specifically, church attendance and religious practices have been noted to improve mental health [4]. In addition, community-based surveys have demonstrated that individuals who attend religious services are happier and more giving of their personal resources [5]. The purpose of this study was to specifically evaluate the impact of patients' depth of religious adherence on their outlook on disease and treatment in a glaucoma population.

This study consisted of a prospective survey of consecutive open-angle glaucoma or ocular hypertension patients. The survey evaluated patients' self-reported global religious adherence, their adherence to specific basic activities and knowledge of the faith ('maturity' questions) and their derived 'comfort' (ability to cope, attitude toward glaucoma, motivation to take medication and God's

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Table 1. Questions asked to determine religious adherence, extent of religious activity, knowledge and perceived benefit from religious beliefs

	Patients, n	Average score
1: I consider myself a religious person	248	1.7 ± 1.3
2: My religion/spirituality helps me cope	245	2.0 ± 1.8
3: My religion/spirituality helps me keep a positive attitude	245	1.8 ± 1.7
4: I draw encouragement from my religious/spiritual community	244	1.9 ± 1.7
5: Overall influence of my religion/spirituality is	239	1.6 ± 1.4
6: I believe God	237	1.0 ± 1.3
7: Regarding my glaucoma, I believe God	238	0.9 ± 0.9
8: The influence of God on my treatment	235	1.3 ± 1.2
9: I read the Holy Scriptures	237	2.2 ± 1.8
10: I verbally encourage other people to have faith	235	1.9 ± 1.7

Patients were not required to respond if they did not desire. The maximum number could be 248. Patients rated their scores on a 7-point scale (0–6) with 0 being the most adherent or reflecting the greatest benefit. The average answer scores ± SD for all patients are shown in the right column.

concern). Results from the comfort questions were analyzed based on responses to each maturity question (adherent: scores 0–1; less adherent: scores >1).

If a patient agreed to participate, the study coordinator ensured that the patient had signed a Health Insurance Portability and Accountability Act waiver allowing use of his/her deidentified personal information for research. The study coordinator also completed the section of the survey about the patient's medical history before providing it to the patient. The coordinator explained the survey to the patient. The patient then answered the remaining questions. Each question was in the form of a visual analog scale marked from 0 to 6, with each end labeled with 2 possible extremes of answers for that question (e.g. 0 = 'happy' and 6 = 'not happy'). The numbers between these extremes (1–5) represented a continual gradation of potential responses between the 2 extremes.

The patients were instructed to take as much time as they needed to complete the survey. They were not required to respond to every item on the form. They were asked not to make any notations on the survey that would identify them to the investigator. The patients were not financially compensated for their participation.

A one-way ANOVA was used to evaluate each response to the 5 comfort questions based on whether they were adherent or less adherent on each of the 4 maturity questions (20 separate evaluations) [6]. Because of the multiple analyses of the comfort questions, we used a modified Bonferroni correction ($\alpha/10$) to adjust the p value to declare significance [7]. We also evaluated the re-

sults by the number of patients who answered any of the maturity questions as adherent or less adherent. A one-way ANOVA was used to evaluate between adherent and less adherent responses for each comfort question [6]. We used a correlation coefficient to evaluate the consistency (questions 3 and 5) between the 2 confirmatory questions and the accuracy of the patients' self-assessment questions about their actual religious practice (maturity questions) [8]. We also performed a multivariable linear regression analysis used to evaluate statistical associations of religious adherence with the patients' history as well as the maturity questions.

In total, 248 self-professed Christians were surveyed. Of these, 139 were Caucasian, 87 African-American and 5 other (17 unknown); 122 were male and 124 female (2 unknown), and 198 had primary open-angle glaucoma, 19 had ocular hypertension and 26 other diseases (6 unknown). The average age was 67.0 ± 13.3 years. Several patients declined to fill out at least 1 item on this portion of the history. The mean scores for each question (table 1), the scores for each comfort question based on whether they were adherent on each of the 4 maturity questions (table 2), and the scores for each comfort question for those who were adherent on multiple maturity questions (table 3) are presented in the tables.

This study showed that patients who were adherent to activities meant to create religious maturity (drawing encouragement from other Church members, reading the Scriptures or encouraging others to have faith), and who demonstrated at least a basic knowledge about the faith,

Table 2. Mean scores for comfort questions based on responses to the maturity questions

Maturity	Patients n	Response	Mean comfort scores					
			Q1	Q2	Q3	Q5	Q7	Q8
Q4	120	adherent	0.9	0.7	0.8	0.8	0.4	0.7
	124	less adherent	2.8	3.9	3.1	2.6	1.4	2.0
Q6	184	adherent	1.1	1.2	1.1	1.0	0.6	0.8
	53	less adherent	3.0	3.0	2.6	2.4	1.9	2.1
Q9	96	adherent	1.3	0.7	0.6	0.7	0.5 ^a	0.6
	141	less adherent	2.2	2.8	2.7	1.9	1.0	1.5
Q10	115	adherent	1.1	1.2	0.9	1.1	0.7	0.7
	120	less adherent	2.2	3.0	2.8	2.3	1.2	1.7

The p value for all questions is <0.0001, except ^a p = 0.0002. 'Adherent' is defined as a score of 0–1 and 'less adherent' is a score of >1. Values represent the average scores for each comfort question (1, 2, 3, 5, 7 and 8) among those adherent or less adherent for each maturity question (4, 6, 9 or 10). Q = Question.

Table 3. Mean scores of comfort questions for responses to any 2, 3 or 4 maturity questions between 0 and 1 (adherent score)

Number of maturity questions	Patients n	Response	Mean comfort scores					
			Q1	Q2	Q3	Q5	Q7	Q8
Any 2	40	adherent	2.0 ^a	2.2	1.9	1.8	0.9	1.3
	101	less adherent	2.5	3.2	3.0	2.5	1.4	2.1
Any 3	50	adherent	1.1	0.9	0.8	0.8	0.5	0.7
	141	less adherent	2.4	2.9	2.7	2.3	1.2	1.9
All 4	57	adherent	0.8	0.8	0.6	0.6	0.5	0.5
	191	less adherent	2.0	2.4	2.2	1.9	1.0	1.5

The p value for all questions is <0.001, except ^a p = 0.054. The table shows the scores for each comfort question based on the number of maturity questions (on any 2 or 3 or all 4 questions) for which a patient was classified as 'adherent' (score 0–1) or 'less adherent' (score >1). Q = Question.

demonstrated greater comfort regarding their glaucoma and treatment ($p < 0.0001$). Specifically, comfort was manifested as: a positive attitude toward their glaucoma, a better ability to cope with their disease, and a belief that God was concerned about their glaucoma and helped with their treatment. There was a statistical correlation between comfort questions 3 and 5, which was used to assess the consistency of the patients' responses regarding the effect of religious adherence on their view of their glaucoma and treatment ($\rho \geq 0.64$; $p = 0.0001$).

When the findings were further analyzed by assessing those subjects who were classified as 'adherent' on multiple maturity questions, a greater separation between

groups on the comfort question was shown with any 2 or 3 of these questions classified as adherent. This finding may indicate that the more serious people are about the practice of their religion, the greater sense of wellbeing they may derive in relationship to their glaucoma disease and treatment.

Our findings are consistent with the systemic literature that shows religious people generally have a better sense of wellbeing [1–4]. However, this study adds to the literature by showing such findings in ophthalmology and specifically in glaucoma patients. In addition, this study found a further benefit to the sense of wellbeing in patients more active in and knowledgeable about their religion.

The results of this study are clinically important because if glaucoma patients indicate that they are religious persons adhering to the Christian faith, the physician may have some confidence that they might better cope with the fact they have glaucoma and their need for treatment. Further, if patients have indicated that they are discouraged by their disease, the physician might consider encouraging them to seek a greater spiritual basis for their life to help them better cope with their glaucoma.

This study suggests, at least for the Christian faith, that religious patients are subjectively more prone to cope with treatment, and that religiosity increases the self-confidence and possibly the quality of life of patients with glaucoma or ocular hypertension. Whether this necessarily translates into better glaucoma practices remains to be demonstrated by further studies.

The strength of the current study design rests in its evaluation of a pure treatment group and the exploration of not only the patients' religious identification but the depth of their adherence. Further, we assessed both the quality of life and the impact on their treatment. However, the study was limited because the data were self-reported and not collected by independent observation. In addition, the current survey was developed specifically

for this study, based on maturity principles in the Biblical text and subjective clinical measures, but it was not validated.

In the future, standard validated measures to help measure the spiritual impact of the lives of patients on clinical treatment and adherence will improve our ability to compare studies across different institutions. In addition, more research is required to fully understand the impact of religion/spirituality of all faiths on the treatment and clinical course of glaucoma. This may be especially true for compliance. We have found no impact of the strength of religious adherence on self-reported glaucoma compliance (internal data; W.C.S.), which is consistent with the systemic literature [9]. Future research should clarify the benefits of religious practice for the wellbeing of ophthalmic patients and any impact on the disease treatment itself.

Conflict of Interest

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