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The Effect of Counseling on Cataract Patient Knowledge, Decisional Conflict, and Satisfaction

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Abstract

Purpose—Cataract is the leading cause of non-refractive preventable blindness, and comprehensive strategies to increase cataract surgery rates are imperative, including high-quality supportive patient education. We evaluated the effectiveness of non-physician pre-surgical counselors teaching patients about cataract and cataract surgery in improving patient knowledge, decisional conflict, and satisfaction.

Methods—A survey was given before and after 61 newly-diagnosed cataract patients underwent pre-surgical counseling at the Aravind Eye Hospital, Madurai, India. The survey measured change in cataract knowledge and decisional conflict, a measure of anxiety surrounding the decision to undergo surgery, along with patient satisfaction. Multiple regression was used to identify factors that influenced change in knowledge.

Results—Both patient knowledge scores and decisional conflict scores improved following counseling (mean difference +2.0, $P=0.004$ and +8.4, $P<0.0001$, respectively). Multiple regression analysis identified female sex ($\beta=2.5$, $P<0.001$) and being illiterate ($\beta=1.7$, $P=0.04$) as important predictors of increased knowledge post-counseling.

Conclusion—Counseling both improved knowledge and reduced decisional conflict about cataract surgery, particularly among patients who had traditionally had more limited access to

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Tables S1 and S2, Appendix 1 and 2, and Figure S1 are for on-line presentation only.

healthcare such as women and illiterate patients. Increased use of high quality counseling might help to further reduce the global burden of cataract and other forms of blindness.

Keywords

cataract surgical rate; counseling; education; international ophthalmology; workforce; epidemiology of blindness

INTRODUCTION

Worldwide, over 300 million people are visually impaired and 45 million are blind; 90% of the blind live in low-income countries.¹ Cataract is the leading cause of non-refractive reversible blindness, accounting for 39%, or 18 million cases of blindness. The burden of blindness from bilateral cataract is expected to rise to 40 million by the year 2020.² Cataract is more often a cause of blindness in low-income nations, although cataract is also a leading cause of blindness in medically-underserved areas of high-income nations.³ Cataract surgical rate parallels this disparity with a rate of 100 cataract surgeries per million people per year in some low-income countries rising to 6,000 cataract surgeries per million people per year in higher-income countries.⁴

In 1981, Venkataswamy and Brilliant found that more than 80% of blind patients in India referred for cataract surgery did not undergo surgery in a 2-year follow-up period due to economic or social barriers.⁵ Although blinding cataract is most often left untreated because of a lack of access to quality surgical care, fear of surgery is also an important barrier to cataract treatment. Among 5,150 people over the age of 40 years examined in districts served by a hospital system in India that offered free cataract surgery, transportation and accommodation, 28.7% of those who felt they needed eye care but did not use eye-care services that were available in their area did not access the system out of fear.⁶ Over half (54.1%) of those who felt they needed eye care but did not use available services reported that they did not access services because they did not think their eye problem was important.⁶ In population-based studies in Sri Lanka,⁷ Guatemala⁸ and Nepal,⁹ subjects reported that fear and a lack of awareness of treatment for their vision loss were important barriers to accessing cataract treatment along with financial constraints, not having someone to accompany them to the surgery, and distance to the hospital.

In order to address the burden of cataract blindness, 3 things are needed. Better cataract screening is imperative to detect subjects with operable cataracts. Next, high-quality, efficient cataract surgical techniques and an adequate number of well-trained surgeons is crucial. Finally, in an attempt to help with the limited number of cataract surgeons in less developed nations, it is important to develop strategies to use non-medical personnel to both persuade patients of the value of cataract surgery and deliver high-quality education and counseling to improve patients' understanding and satisfaction with their medical care. Patient satisfaction is essential, as much of the marketing for the benefits of cataract surgery occurs by word-of-mouth, and a satisfied patient will likely improve future recruitment and reduce fear of surgery.¹⁰

The Aravind Eye Care System (AECS) is the largest self-sufficient eye care system in the world performing over 300,000 cataract surgeries annually, about 65% of which are performed free of charge or at a significantly reduced fee. AECS has developed numerous innovative programs to increase cataract surgery volume and efficiency while maintaining high quality outcomes in order to sustain their financial viability with their payer mix.³

One factor that could contribute to AECS' success in patient acceptance of cataract surgery is its counseling system.¹¹ These counselors are specialized and highly trained (2 years) high school graduates who act as physician extenders, thus decreasing the amount of time a physician must spend counseling a patient. This system allows physicians maximal time to diagnose and manage disease and perform surgery without sacrificing patient education. A similar counseling system may become equally important in higher-income countries as the costs of healthcare continue to rise and the number of physicians per capita falls.¹²

We prospectively evaluated the effect of the AECS counseling system on patients' knowledge of both cataract and cataract surgery, decisional conflict and patient satisfaction with counseling.

MATERIALS AND METHODS

Inclusion and exclusion criteria

We included new, paying patients, aged 40 years, who spoke Tamil, lived within 100km of the hospital and had cataract surgery recommended by an AECS physician. We excluded subjects who had been previously seen or treated for any chronic eye disease, had previous cataract surgery, or had been diagnosed with traumatic cataract or secondary cataract.

Sample selection

We administered a survey to all eligible patients after cataract surgery was recommended, both before and after their individual counseling session (Figure S1, online only). A prior 20-patient pilot study revealed that we needed to test 55 subjects to detect a significant difference between pre- and post-counseling scores on the Knowledge Questionnaire and the Decisional Conflict Questionnaire at a power of 90% and with a Type I error of 0.05. 5 consecutive patients who met eligibility criteria and consented to participate were included in the study each day until the recruitment target was met. There was an 81% response rate, where 75 eligible patients were approached and 61 consented to participate in the study. Demographic characteristics were not recorded for patients who did not consent to participate in the study.

Questionnaires and outcome measures for cataract patients

The knowledge questionnaire (Table S1, online only) included questions that the counselors and cataract surgeons felt patients should know the answers to before undergoing cataract surgery. The decisional conflict questionnaire was based on the validated decisional conflict scale¹³ (Table S2, online only). Decisional conflict is a state of uncertainty about the course of action to take, and is a description of the anxiety that surrounds the decision-making process.¹³ The original decisional conflict scale validated for breast cancer screening and

influenza immunization included 9 items. All of the original 9 scale items were included in our questionnaire. 7 new items are under evaluation and we chose to include 3 of the 7 new items that we felt best reflected the cultural norms of Madurai, India (new items denoted with *, Table S2). “Cataract surgery” was substituted for “flu shot” after the stem of the statement for each scale item. All questionnaires were written in English, translated to Tamil, and then translated back to English by a different researcher to ensure accurate translation.

Our secondary outcome was patient satisfaction with their counseling, which was measured by a validated scale, the Patient Satisfaction with Cancer Treatment Education (PS-CaTE), that had been adapted to cataract education.¹⁴ We used the subscales for satisfaction with information regarding cancer treatment, satisfaction with information sources and satisfaction with the way information was provided. We substituted the words “cataract surgery” for “cancer treatment.” We also recorded the cataract surgical acceptance rate, although the study was not powered to detect a difference between cataract surgery acceptance rates. The cataract surgical acceptance rate was calculated as the percent of counseled patients who underwent cataract surgery within 30 days of their chosen date because that is how the counselors currently track their success rate at AECS.

Since all patients at AECS undergo counseling prior to cataract surgery, there was no control group for comparison. Baseline vision and sociodemographic characteristics were collected, including age, sex, education, income, occupation, insurance status and whether the patient was the primary decision maker.

Evaluation of the cataract counselors

The counselors’ training included classroom work and hands-on training with supervision and extensive feedback. This coursework included diverse training in topics ranging from the importance of body language to an understanding of the cataract disease process and the types of surgical methods used to treat cataract. They were instructed to try to individualize their counseling based on patient needs,¹⁵ and this could range from trying to find a counselor who can speak the patient’s native language, if possible, to using simpler versus more complex language depending on patient educational level. The 4 cataract counselors took an in-depth test of cataract knowledge and treatment that was developed by the cataract surgeons involved in the study, which included all of the questions asked of the patients along with additional questions (on-line Appendix 1). We also recorded number of years of counseling work experience for each counselor.

Analyses

Statistical analyses were performed using Stata software version 11.0 (StataCorp, College Station, TX, USA). Participant characteristics were summarized using means and standard deviations for continuous variables and frequencies and percentages for categorical variables.

We used univariate regression analysis to determine whether the relationship between change in knowledge score was associated with any of the following independent variables; age, sex, literacy/educational level, counselor knowledge score, patient pre-operative

presenting visual acuity and insurance status. If the relationship was significant to $P < 0.10$, we used the predictor variable in the multivariable regression. Pearson correlation coefficients were calculated to evaluate the relationship between counselor knowledge score and counselor years of experience and the following patient outcomes: 1) Change in patient knowledge; 2) change in decisional conflict; and 3) overall patient satisfaction with the counselor's education. Pearson correlation coefficients were calculated to evaluate the association between subject satisfaction with education and 1) change in patient knowledge, and 2) change in decisional conflict.

Statement of ethics

The study was approved by the AECS Institutional Review Board and adhered to the principles outlined in the Declaration of Helsinki. We certify that all applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed during this research.

RESULTS

Baseline patient and counselor characteristics

A total of 61 subjects completed the survey before and after their counseling session. The average age of our population was 57.8 ± 9.2 years (Table 1). There were more men than women, with 38 men (62.3%). Among the men, 86.8% considered themselves the primary decision maker for deciding whether or not to undergo cataract surgery compared to 26.1% of women who considered themselves the primary decision maker. In our sample, 16.4% of subjects were illiterate. Preoperative presenting visual acuity in the better-seeing eye was not significantly different between those who did and did not undergo cataract surgery (logarithm of the minimum angle of resolution, LogMAR, vision 0.19 ± 0.17 for those who underwent surgery vs 0.16 ± 0.17 for those who did not undergo surgery, $P = 0.5$).

Counselors had between 5 and 25 years of experience. Counselors scored between 85% and 100% on the knowledge test. The 30-day cataract surgery acceptance rate for counselors was between 25% and 74% (Table 2).

Change in knowledge

Patient knowledge scores improved 18% following counseling (mean difference pre- to post-counseling, +2.0 questions/11 total questions, $P = 0.004$; Table S1). We used multiple regression analysis to evaluate if significant sociodemographic factors predicted which patients would gain the most knowledge during their counseling session after adjusting for possible confounding variables (Table 3). We found that women ($P < 0.001$) and illiterate patients ($P = 0.04$) had the largest increase in knowledge after the counseling session. Mean change in knowledge showed a trend towards being higher among patients who chose to have cataract surgery (2.2 ± 2.2 points vs 1.7 ± 2.1 points, $P = 0.3$).

Change in decisional conflict

Patient decisional conflict scores improved by 14% after counseling (37.1 ± 6.3 points pre-counseling, 62%, to 45.6 ± 6.7 points after counseling, 76%; $P < 0.0001$; Table S2).

Counseling significantly improved patient decisional certainty, meaning that anxiety surrounding the decision to undergo cataract surgery was both clinically and statistically significantly reduced by the counseling. The decisional conflict score was significantly improved both among those who chose to undergo cataract surgery ($P<0.001$) and those who did not choose to undergo cataract surgery ($P=0.0002$), meaning that counseling helped the patient become more sure of their decision regardless of what they decided. The mean change in decisional conflict score was not different between patients who underwent surgery and those who did not ($P>0.1$).

Satisfaction with education

Overall, 69.1% of participants were very satisfied with their counseling, 29.8% were satisfied, and 1.1% were neutral or dissatisfied. 93.0% of subjects reported that the counselors influenced their decision to undergo cataract surgery, and 98.4% of subjects reported that the counselors contributed significantly to their overall satisfaction with their medical care. Counselor knowledge scores were correlated to patient satisfaction score (Pearson correlation coefficient 0.50, $P<0.001$; Table 4). Undergoing surgery was associated with increased satisfaction score ($P=0.10$).

Primary decision maker

More men than women considered themselves to be the primary decision maker (86.8% vs 26.1%, respectively). Among men, 63% had surgery if they were the primary decision maker and 60% had surgery if they were not the primary decision maker. However, among women, while 83% had surgery if they were the primary decision maker, only 52% had surgery if they were not the primary decision maker.

DISCUSSION

Our study found that the individualized counseling system used at AECS improved patient knowledge about cataract surgery and decreased their decisional conflicts, meaning that counseling minimized patient anxiety about whether or not to undergo surgery. A previous evaluation of the AECS cataract counseling system showed that it decreased patient fear during cataract surgery as well.¹¹ Changes in knowledge and decisional conflict that we noted after counseling may lend insight into how the counseling system at AECS improves the cataract surgery acceptance rate.

A recent randomized controlled trial (RCT) in China evaluated the impact of a standardized educational intervention delivered by a 5-minute video and 5-minute scripted encounter, finding it did not improve the cataract surgery acceptance rate.¹⁶ The authors felt that their educational intervention would have been more successful if they had imparted the knowledge that cataract must be treated surgically. In our study, the counselors successfully imparted the knowledge that cataract can only be treated surgically (change from 54.1% before counseling to 83.6% following counseling, Table S1) While this knowledge still may not translate into improved cataract surgery acceptance in an RCT, it shows that these counselors effect change in important aspects of patient knowledge.

Recent systematic reviews have concluded that personally tailored health communications have a greater influence on health behavior change than generic educational material,^{17,18} and the way in which AECS counselors tailor their education to an individual's needs may be one source of its effectiveness. Important aspects of AECS counseling were connecting with the patient, making them feel at ease and personalizing the way in which the standard information was delivered (Appendix 2, online only). The way in which this education is delivered deserves further study, as it may be important in influencing behavior.

Patients who have been traditionally medically underserved, women and illiterate patients^{19–21} began with the lowest scores on their knowledge questionnaire and had the largest increase in knowledge after counseling. This highlights the importance of effective education in empowering disenfranchised groups. Furthermore, women have a higher prevalence of blindness worldwide²² and they have been noted to accept free cataract surgery less often than men.^{19–21, 23} If the AECS system of cataract counseling is particularly effective in teaching women, and especially women who are illiterate, it may serve as a good model for effecting behavior change in other low- and middle-income countries where women bear a disproportionate burden of blindness from cataract.

The strengths of this study lie in its multiple measures of the effects of cataract patient counseling, including not only knowledge but also decisional conflict and satisfaction with education. One hypothesis that came from observing the cataract counselors (Appendix 2), is that it is the way in which the counselors make a point of connecting with their patients and tailoring their education to meet patient individual needs that makes them successful. The counselors were trained to make personal connections with their patients even as they serve many patients in a day, talking with each patient who has never had cataract surgery for an average of 11 minutes, and with each patient who is returning to undergo surgery on the second eye for 5 minutes. Counselors also spent additional time answering questions over the phone after the initial in-person consultation. This data was not collected for each subject enrolled in the study, and time spent in face-to-face counseling and telephone counseling will be important to collect in future studies.

Major limitations of this study are its lack of a control group and the fact that it was not powered to detect a difference in cataract surgery acceptance rates between different groups of patients or between different counselors. We could not undertake an RCT because counseling is the standard of care for all patients undergoing cataract surgery. As this was our first study evaluating the effects of the counseling system, we did not have the power to detect a difference in cataract surgery acceptance rate based on differences in change in knowledge, change in decisional conflict, satisfaction, caste, sex, counselor experience, counselor knowledge, preoperative vision, socioeconomic status, or health literacy, among others. We also were not powered to explore why there was wide variability in surgical acceptance rates between counselors. Identifying why certain counselors may have higher surgical acceptance rates will be important in informing counselor training programs. Furthermore, this study only evaluated the outcomes for counseling of paying patients. 40% of patients at AECS were paying patients, while 60% of patients were not required to pay. The hectic nature of, and volume of patients at the eye camp in which non-paying patients are counseled makes it much more difficult to carry out a study for non-paying patients;

these hurdles will need to be overcome as such data is important to collect in the future. In addition, reasons for non-participation in the study were not assessed, and will need to be evaluated in a future, larger study, as the study sample may have been biased by not including those who were most fearful of surgery and thus did not want to participate.

Using a model where primary ophthalmic patient education is not the physician's task, but is delegated to trained educators may be prudent in other areas of ophthalmology as well, such as for patients with glaucoma or diabetes. Glaucoma and diabetes are both chronic diseases requiring the patient to participate in daily self-management and chronic therapies, and often patients cite a lack of understanding of the disease as a prime reason for poor adherence to their recommended treatment.^{24–27} Prevalences of both glaucoma²⁸ and diabetes²⁹ are projected to continue to rise as the population ages. This may require ophthalmologists to re-structure the way care is provided in order to provide high-quality care to an increasing number of patients. One way to increase the reach of an ophthalmologist is to use trained non-physician educators, like the cataract counselors at AECS. The AECS model of a codified training system for counselors, using an individualized approach to counseling, and creating a system that allows counselors to track their success by their cataract surgery acceptance rates, is an effective model for providing high-quality patient education in an extremely high-volume system.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Study subject flow pre-cataract surgery counseling, Aravind Eye Care System, India

Table 1

Sociodemographic characteristics of patients undergoing pre-cataract surgery counseling, Aravind Eye Care System, India

Variable	
Age , mean±SD (range) years	57.8±9.2 (20–76)
Sex , n (%)	
Male	38 (62.3)
Female	23 (27.7)
Literacy , n (%)	
Illiterate	10 (16.4)
Literate, completed primary education	13 (21.3)
Literate, completed secondary education	22 (36.1)
Literate, completed higher secondary education	13 (21.3)
Literate, completed college/polytechnic	3 (4.9)
Occupation , n (%)	
Household work	1 (1.6)
Agriculture	0 (0.0)
Unskilled labor	23 (37.7)
Skilled labor	6 (9.8)
Business/shop	2 (3.3)
Professional	4 (6.6)
Not working	25 (41.0)
Insured , n (%)	
Yes	12 (19.7)
No	49 (80.3)
Primary decision maker , n (%)	
Yes	39 (63.9)
No	22 (36.1)

SD, standard deviation

Table 2Cataract surgery counselor characteristics^A, Aravind Eye Care System, India

Counselor	Experience, years	Knowledge score, %	Cataract surgery acceptance Rate, n/N (%)
1	25	100	20/27 (74)
2	20	89	1/4 (25)
3	5	85	8/11 (73)
4	5	96	7/16 (44)

^A Of 61 patients in the study, 3 were counseled by counselors who had not undergone the knowledge assessment.

Table 3

Regression analyses for associations with change in knowledge score of patients undergoing pre-cataract surgery counseling, Aravind Eye Care System, India

Variable	Unadjusted		Adjusted*	
	Beta	P-value	Beta	P-value
Age, years	-0.05	0.08	-0.06	0.04
Sex (male/female)	2.18	<0.001	1.73	0.02
Literacy (yes/no)	1.52	0.04	2.10	0.02
Occupation (working/not working)	1.30	0.02	1.01	0.10
Insured (yes/no)	-0.17	0.82	-	-
Primary decision-maker (yes/no)	1.02	0.08	-1.39	0.07
Fear of surgery (yes/no)	-0.98	0.11	-	-
Counselor knowledge score	0.10	0.43	-	-
Patient satisfaction score	0.16	0.03	0.15	0.03
Vision, worse seeing eye (<20/200/>20/200)	-0.60	0.32	-	-

R-square = 0.41, adjusted R-square = 0.34

* Adjusted for...

Table 4

Pearson correlation between counselor knowledge, counselor experience, patient satisfaction and patient knowledge, satisfaction and decisional conflict for precataract surgery counseling, Aravind Eye Care System, India

Variable	Correlation coefficient	P-value
Counselor knowledge vs change in patient knowledge score	0.10	0.43
Counselor knowledge vs change in decisional conflict score	0.08	0.54
Counselor knowledge vs patient satisfaction score	0.50	<0.001
Counselor experience vs change in patient knowledge score	0.01	0.92
Counselor experience vs change in decisional conflict score	0.02	0.90
Counselor experience vs patient satisfaction score	0.22	0.08
Patient satisfaction score vs change in patient knowledge score	0.28	0.02
Patient satisfaction score vs change in patient decisional conflict score	0.31	0.02