Original Article

Knowledge, attitude, and practice toward glaucoma and its management among adult Saudi patients

Waleed A. Al Rashed, Abdulelah S. Bin Shihah[1], Abdulrahman S. Alhomoud, Muteb M. Alharbi[2], Asem M. Shadid[3], Mushref A. Alghamdi[2], Alanoud Alfaris[4], Ahmad W. Alrashed[5], Essam A. Osman[6], Rajiv Khandekar[7]

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Department of Ophthalmology, College of Medicine, Imam Mohammad Ibn Saud Islamic University (IMSIU), [1]Department of Family Medicine (IMSIU), [2]Department of Ophthalmology (IMSIU), [3]Department of Dermatology (IMSIU), [4]Medical Complex: Imam Mohammad Ibn Saud Islamic University (IMSIU), [5]Medical Student, College of Medicine, King Saud University (KSA), [6]Department of Ophthalmology, College of Medicine King Saud University (KSA), [7]Ophthalmic Epidemiology and Low Vision Services at King Khaled Eye Specialist Hospital (KKESH) Riyadh, Saudi Arabia

Address for correspondence:
Dr. Asem Mustafa Shadid, College of Medicine, Imam Mohammad Ibn Saud Islamic University, P.O. Box 63146, Riyadh 11516, Saudi Arabia.
E-mail: asem.sh@hotmail.com

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Abstract:

PURPOSE: To present the level of knowledge, attitude, and practice (KAP) for glaucoma management and their determinants among adult Saudi patients.

METHODS: The study was conducted between January and June 2017. Glaucoma patients from the ophthalmology clinic were interviewed. Demographics and disease-related information were noted. The questionnaire included four K questions, seven A questions, and six *P* questions. The correct response of questions were summed for K, A, and P, and the percentile was calculated. K and *P* scores were graded as excellent (more than >75%), good (51%–75%), poor (26%–50%), and very poor (≤25%). If A score was >50%, it was termed as positive.

RESULTS: We interviewed 263 adult glaucoma patients. Their mean age was 61.6 ± 14.2 years. The excellent grade of knowledge about glaucoma and its management was 63 (24% [95% confidence interval (CI) 18.8–29.1]). Poor grade of knowledge was 95 (36.1% [95% CI 30.3–41.9]). The attitude toward glaucoma and its management was positive in 89 (33.8% [95% CI 28.1–39.6]). The practice to manage glaucoma was of excellent grade in 10 (3.8% [95% CI 1.5-6.1]). The overall excellent grade of KAP glaucoma patients was 17.9% (13.2–22.5). Good practice for glaucoma management was associated with a history of glaucoma surgery ($P < 0.001$), longer duration of glaucoma ($P = 0.02$), and young age ($P = 0.004$).

CONCLUSIONS: Low KAP about glaucoma disease and medication among Saudi glaucoma patients is a matter of concern. Strategies are needed to improve the KAP of glaucoma patients.

Keywords:

Attitude and practice, glaucoma, knowledge, visual disabilities

Introduction

Glaucoma is a leading cause of visual disability among adults and requires lifelong management. Patient cooperation is vital for improving compliance and delaying visual disability.[1,2] Hence, factors that improve patient adherence need to be identified and addressed. Patients' knowledge and attitude influence the use of medication in chronic diseases such as glaucoma.[3]

A number of studies have been conducted to understand the role of knowledge, attitude, and practice (KAP) related to glaucoma among the Western and Far Eastern populations.[4,5] Adherence rates have been evaluated in Arab populations.[6,7] Although KAP for chronic eye diseases was evaluated in the Middle East, focus on glaucoma was limited.[8] To the best of our knowledge, KAP toward glaucoma has not been evaluated among Saudi patients.

We evaluated the level of KAP factors related to glaucoma and their association with clinical and demographic data among adult Saudi glaucoma patients.

Methods

This is a cross-sectional survey of the KAP toward glaucoma and the related determinants of enrolled adult Saudi patients who presented to a tertiary eye care medical city hospital in

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Riyadh, Saudi Arabia. Patients of both Riyadh and other areas are getting services at our institution. The ethical and human research committee of the institute approved this study. As no personal information was collected or active health intervention was planned, only written informed consent was required and obtained from all study subjects. The study was conducted between January 2017 and June 2017. Those verbally agreeing to participate and >18 years of age were included in the survey. Those declining to participate, patients with ophthalmic disease other than glaucoma, and patients with serious health ailments precluding participation were excluded from this study.

We assumed that among 1236 patients visiting the eye department of a tertiary eye hospital, 28% of glaucoma patients would have an acceptable level of KAP (>75% responses agreeable to the expert's response).[9,10] To achieve a 95% confidence interval (CI) and an acceptable error margin of 5% for a cross-sectional survey, at least 248 participants had to be interviewed.

Two medical graduates trained in conducting an interview for this specific survey were the field investigators. On a daily basis, randomly selected one session (morning or afternoon) was selected. First, three cases coming to the glaucoma clinic were approached for participation in the survey. Data on patient demographics were collected and if required were verified from health records. Data were collected on patients' age, gender, education level, and location of residence (urban/semiurban). Data were also collected on previous glaucoma surgery including YAG laser peripheral iridectomy, use of oral glaucoma medications, number of medications, and family history of glaucoma.

A pretested questionnaire was used [Appendix 1]. While formulating the questionnaire, the research on these topics was referred and adopted.[9-11] There were four questions related to glaucoma and the medical treatment of glaucoma. Seven questions queried belief and patient attitude on glaucoma medication and medical care. Six questions queried practice including using topical glaucoma medications as recommended, inquiring about glaucoma status at each visit, judiciously attending follow-up appointments, and undergoing surgery/laser as recommended by the ophthalmologists. A 5-point Likert scale was used to grade the responses of the study participants. The responses included two positives, two negatives, and one undetermined. Grading of the responses was as follows: +2 score for complete correct agreement; +1 for correct partial agreement; 0 if the patient was partly incorrect and not agreeing; −2 for strong incorrect disagreement. For practice-related questions, the grading was as follows: 1 for correct practice and − 1 for incorrect or "I do not know" response. The total score of KAP-related responses was added together. An excellent response was a total score of 75% or higher, an acceptable or good response was a total score between 50% and 75%, a poor response was between 25% and 49%, and a very poor response was a total score of less than 25%.

The questionnaire was prepared in English and then translated into Arabic. To ensure consistency of translation, a reverse translation was performed. Data from all questionnaires were entered into an Excel® Spreadsheet (Microsoft Corp., Redmond, WA, USA). The skills of both interviewers were compared for consistency, and the agreement was greater than 92%.

The data were transferred to Statistical Package for the Social Sciences (SPSS-23, IBM, Chicago, IL, USA) for analysis. Univariate analysis using parametric method was performed. For the categorical variable, we calculated frequency and percentage proportion with its 95% CI. For numerical variables, we calculated the mean and standard deviation. To compare subgroup outcomes, we used a 2 × 2 table or dose–response function in Open Epi® software (Candler Library, Suite 400 550 Asbury Circle Atlanta, Georgia 30322-1016).[12] Statistical significance was indicated by a two-sided $P < 0.05$. For comparing continuous variables, a *t*-test with $P < 0.05$ indicated statistical significance.

Results

Of the 300 glaucoma patients approached, 263 adult glaucoma patients, which is a response rate of 87.7%, were interviewed. Their mean patient age was 61.6 ± 14.2 years. Table 1 presents the demographic profile and data on glaucoma medications.

Table 1: Demographic profile and glaucoma status of the adult Saudi patients

	n (%)
Gender	
Male	152 (57.8)
Female	111 (42.2)
Education	
Illiterate	156 (59.3)
School graduates	66 (25.1)
College graduates	41 (15.6)
Resident	
Urban	177 (67.3)
Semi urban	86 (32.7)
Hx glaucoma in relative	
Yes	141 (53.6)
No	122 (46.4)
Hx glaucoma surgery	
Yes	200 (76)
No	63 (24)
Duration of glaucoma (years)	
<1	115 (43.7)
1-5	96 (36.5)
>5	52 (19.8)
Glaucoma medications	
Yes	256 (97.3)
No	7 (2.7)
Number of glaucoma medications advised	
1	54 (20.5)
2	141 (53.6)
3	54 (20.5)
4	14 (5.3)

Hx: History of

Seventy-five percent of the patients had a history of glaucoma surgery. Half of the patients had relatives with glaucoma. Three percent were not prescribed topical glaucoma medications at the time of interview.

Sixty-three (24% [95% CI 18.8–29.1]) patients had excellent knowledge about glaucoma and its management. Ninety-five (36.1% [95% CI: 30.3–41.9]) patients had poor knowledge about glaucoma and its management.

The attitude toward glaucoma and its management was positive (>50% score) among 89 (33.8% [95% CI: 28.1–39.6]) patients.

The practice for managing glaucoma was excellent among 10 (3.8% [95% CI 1.5–6.1]) patients and good score among 192 (73% [95% CI 67.6–78.4]) patients.

There were 48 (17.9% [13.2–22.5]) patients with an excellent overall grade of KAP.

To identify the determinants of knowledge, we associated and validated the association of knowledge score to both social determinants and the few known risk factors for glaucoma [Table 2]. The level of education and a relative with glaucoma were significantly associated with the level of knowledge about glaucoma.

A positive attitude toward glaucoma and its management was significantly associated with male and less educated patients [Table 3].

Good practice for glaucoma management was associated with a history of glaucoma surgery ($P < 0.001$), longer duration of glaucoma ($P = 0.02$), and young age ($P = 0.004$) [Table 4].

Discussion

The outcomes of the current study indicate that the level of KAP toward glaucoma and its management among adult Saudi glaucoma patients was lower than desired. Higher education and presence of glaucoma among relatives were significantly associated to better KAP. The association of KAP to the duration of glaucoma and previous glaucoma surgery was not statistically significant.

Strategies need to be implemented urgently to improve patient awareness of glaucoma, change attitudes, and encourage healthier practices among patients. These improvements will increase adherence to the medical regimen for glaucoma and reduce visual disability due to glaucoma. The strengths and weaknesses regarding the KAP of glaucoma patients reported in the present study could be utilized to further enhance the health promotion initiatives and patient counseling.

In the present study, 1 of 6 glaucoma patients had an excellent level of KAP. In a study evaluating teenage glaucoma patients in Ghana, only 37.7% had knowledge of glaucoma.[13] In North India, only 8% of surveyed adults had a good knowledge of glaucoma.[14] In contrast, primary healthcare providers in an Indian study had a very high level of KAP regarding glaucoma.[15] Hence, the level of awareness seems to differ in different populations. Therefore, strategies to improve KAP should be specific to the target population.

A Chinese study reported that patient knowledge of glaucoma was higher among glaucoma patients who are members of a glaucoma patient group compared to patients who were not members.[16] Personal doctor-to-patient

Table 2: Determinants of knowledge about glaucoma and its management among adult Saudi glaucoma patients

	Excellent + good knowledge (n=168), n (%)	Poor + very poor knowledge (n=95), n (%)	Validation
Gender			
Male	88 (52.4)	64 (67.4)	OR=0.5 (95% CI: 0.3-0.9), P=0.02
Female	80 (47.6)	31 (32.6)	
Education			
Illiterate	94 (56.0)	62 (33.5)	χ^2=5, df=3, P=0.03
School graduate	40 (23.8)	26 (14.1)	
College graduates	34 (20.2)	7 (3.8)	
Relative with glaucoma			
Yes	79 (47.0)	62 (33.5)	OR=0.5 (95% CI: 0.3-0.8), P=0.004
No	89 (53.0)	33 (17.8)	
Duration of glaucoma (years)			
<1	67 (39.9)	48 (25.9)	χ^2=0.01, df=3, P=0.94
1-5	61 (36.3)	35 (18.9)	
>5	67 (39.9)	48 (25.9)	
Glaucoma surgery in the past			
Yes	133 (79.2)	67 (36.2)	OR=1.6 (95% CI: 0.8-2.8), P=0.1
No	35 (20.8)	28 (15.1)	
Number of glaucoma medications			
1	38 (22.6)	16 (8.6)	χ^2=0.1, df=3, P=0.8
2	84 (50.0)	57 (30.8)	
3 and more	46 (27.4)	22 (11.9)	
Age, mean±SD	61±14.5	62.7±13.8	P=0.7

P<0.05 is statistically significant. SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

Table 3: Determinants of attitudes about glaucoma and its management among adult Saudi glaucoma patients

	Positive attitude, *n* (%)	Negative attitude, *n* (%)	Validation
Gender			
Male	60 (67.4)	92 (52.9)	OR=1.8 (95% CI: 1.1-3.1), *P*=0.02
Female	29 (32.6)	82 (47.1)	
Education			
Illiterate	45 (50.6)	111 (63.8)	χ^2=10.3, df=3, *P*=0.001
School graduate	19 (21.3)	47 (27.0)	
College graduates	25 (28.1)	16 (9.2)	
Relative with glaucoma			
Yes	44 (49.4)	97 (55.7)	OR=0.8 (95% CI: 0.5-1.3), *P*=0.33
No	45 (50.6)	77 (44.3)	
Duration of glaucoma (years)			
<1	39 (43.8)	76 (43.7)	χ^2=0.4, df=3, *P*=0.5
1-5	28 (31.5)	68 (39.1)	
>5	22 (24.7)	30 (17.2)	
Glaucoma surgery in the past			
Yes	73 (82.0)	127 (73.0)	OR=1.7 (95% CI: 0.9-3.2), *P*=0.1
No	16 (18.0)	47 (27.0)	
Number of glaucoma medications			
1	22 (24.7)	29 (16.7)	χ^2=1.5, df=3, *P*=0.22
2	45 (50.6)	96 (55.2)	
3 and more	22 (24.7)	46 (26.4)	
Age, mean±SD	59.5±15.1	62.7±13.7	*P*=0.7

P<0.05 is statistically significant. SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

Table 4: Determinants of practice about glaucoma management among adult Saudi glaucoma patients

	Excellent + good practice (*n*=219), *n* (%)	Poor + very poor practice (*n*=44), *n* (%)	Validation
Gender			
Male	124 (54.1)	28 (63.6)	OR=0.7 (95% CI: 0.4-1.5), *P*=0.4
Female	95 (41.5)	16 (36.4)	
Education			
Illiterate	130 (56.8)	26 (59.1)	χ^2=0.1, df=3, *P*=0.9
School graduate	54 (23.6)	12 (27.3)	
College graduates	35 (15.3)	6 (13.6)	
Relative with glaucoma			
Yes	119 (52.0)	22 (50.0)	OR=2.5 (95% CI: 1.2-5.0), *P*=0.64
No	102 (44.5)	22 (50.0)	
Duration of glaucoma (years)			
<1	88 (38.4)	27 (61.4)	χ^2=5.6, df=3, *P*=0.02
1-5	84 (36.7)	12 (27.3)	
>5	47 (20.5)	5 (11.4)	
Glaucoma surgery in the past			
Yes	176 (76.9)	24 (54.5)	OR=1.7 (95% CI: 1.7-6.7), *P*=0.0006
No	43 (18.8)	20 (45.5)	
Number of glaucoma medications			
1	44 (19.2)	10 (22.7)	χ^2=0.5, df=3, *P*=0.5
2	116 (50.7)	25 (56.8)	
3 and more	59 (25.8)	9 (20.5)	
Age, mean±SD	61.5±14.9	62.3±10.6	*P*=0.7

P<0.05 is statistically significant. SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

counseling has a positive effect on glaucoma patients and their relatives.[17] To improve KAP among Saudi patients, we recommend the formation of a glaucoma patient group and standard doctor-to-patient counseling sessions.

Beliefs and myths often cause negative attitude toward eye care among glaucoma patients. Religious beliefs were associated with better treatment and less visual disabilities.[18] In our study, there was a markedly negative attitude toward management modalities. In addition, the practice pattern for using glaucoma medication was also low. Thus, there seems to be an impact of knowledge and beliefs on practice patterns among Saudi glaucoma patients. A US study reported that the impact was culture-specific and differed

among different races residing in the same county regarding the beliefs on practice of glaucoma medication usage.[19] Although the Saudi population primarily follows the Muslim religion and has Arab culture, intervention strategies to improve KAP could marginally differ and could be an area of further research.

In the present study, the duration of glaucoma and previous surgeries had a significant association with the better practice of glaucoma medications. Fear for visual disability might have compelled the study participants to adopt better practices among those who had previously undergone surgery. Usually, a longer duration of glaucoma diagnosis results in lethargy and poor compliance.

In a busy practice, often, ophthalmologists do not find one time to interact with their glaucoma patients on a one-to-one basis to explain the disease and importance of regular and lifelong topical medications for controlling IOP. The attitudes of glaucoma patients also play an important role in disease management. Poor knowledge and negative attitude could be detrimental, which results in poor practices. These factors need to be addressed proactively. The patients should take an active interest in managing their affairs. In the era of internet, beneficial information can be accessed easily and online advice is available to help understand the disease process and management.

We had a few limitations in the present study. The current survey enrolled patients attending glaucoma clinics. This was not a community-based survey. Hence, extrapolating the outcome of the present study to all glaucoma patients should be done with caution. The questions related to knowledge were close-ended and not open-ended, which could have introduced social desirability bias, resulting in unintentional over-estimation of the level of KAP. This being a cross-sectional study, an association of determinants of glaucoma to KAP level should be further investigated by having a longitudinal study for confirming this association and propose cause link.

Conclusions

Low awareness of glaucoma and medication usage among Saudi patients is disconcerting. Strategies such as intensifying one-on-one counseling, formation of glaucoma patient groups, and other modern strategies could be utilized to improve the practices of glaucoma patients.

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Conflicts of interest

There are no conflicts of interest.

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Appendix

Appendix 1: Full Questionnaire

Knowledge, attitude, and practice regarding glaucoma and its management among adult Saudi patients

A. Demographic information

Gender: Male/Female **Age**: ____ years **Residence**: Riyadh/Outside Riyadh

Educational level: Uneducated/school graduate/college graduate/higher education

B. Information about glaucoma

When have you diagnosed with glaucoma? Before 1 year/1–5 years/more than 5 years

How many types of drops you use for glaucoma? Only one/2/3/4 or more

Have you ever undergone any surgical procedure to treat glaucoma? Yes/No

Do you have any first-degree relevant suffering from glaucoma? Yes/No

C. Knowledge, attitude, and practice-related questions

S no.	Question	Response				
		Strongly agree	Agree	Not sure	Disagree	Strongly disagree
K1	Glaucoma is usually accompanied by a rise in eye pressure					
K2	Glaucoma could lead to damage to the optic nerve					
K3	Glaucoma could lead to blindness					
K4	There may be no obvious symptoms to the start of the glaucoma					
A1	I believe that skipping a few days of treatment will not affect my eyes					
A2	I believe that the glaucoma may affect my ability to safe driving of the vehicle because of its impact on the side vision					
A3	I believe that all my family members should be screened for glaucoma					
A4	I believe glaucoma eventually leads to blindness so no benefit of using glaucoma drops					
A5	I believe that taking the drops reduces the deterioration of the glaucoma					
A6	I believe that the periodic follow-up reduces the deterioration of glaucoma					
A7	I believe that the vision lost due to glaucoma can be regained by treatment					
P1	I close my eyes for a minute to two after putting the drops					
P2	I use two types of drops at the same time					
P3	I keep my drops in a moderate temperature below 30 degree					
P4	I usually keep following the eye doctor appointments					
P5	I always use the eye drops as the eye doctor asked me					
P6	I always ask my physician about my eye pressure, visual field, and optic nerve status					

D. Sources of information about glaucoma and its treatment

S no.	Current source	Tick all	Desired source	Tick all
1	Ophthalmologist		Ophthalmologist	
2	Nurse		Nurse	
3	Health educator specialist for the eye		Health educator specialist for the eye	
4	Printed brochures		Printed brochures	
5	Online Websites		Online Websites	
6	Social media (Facebook/Twitter/WhatsApp, etc.)		Social media (Facebook/Twitter/WhatsApp, etc.)	
7	Friend/relevant affected by glaucoma		Friend/relevant affected by glaucoma	
8	TV programs		TV programs	
9	Other: Specify: _____		Other: Specify: _____	

E. Glaucoma patient-perceived barriers for periodic ophthalmic examination

S no.	Barrier	Tick all
1	I do not know that I have to check periodically for my glaucoma	
2	I have enough eye drops and use it regularly and so no need to see doctor	
3	Fear of discovery of eye changes lead to surgical intervention	
4	Treatment costs a lot, and I do not have money	
5	I do not think the ophthalmologist is experienced enough to treat me	
6	Use of eye drops causes vision deterioration	
7	I prefer using alternative medicine (herb/honey/etc.)	
8		
9		

Date of interview: DD/MM/YYYY Codeofinterviewer:_____1