Knowledge and awareness of age related eye diseases in the population of the western region of Saudi Arabia

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Abstract

Background: Visual impairment represents one of the most important public health issues that significantly affects quality of life of millions worldwide, so increasing awareness will likely promote effective management and result in minimizing the burden of visual impairment and expense of eye care.

Objectives: The study aimed to evaluate the knowledge and awareness of the Saudi Arabian population in the western region regarding old age related eye diseases i.e. cataract, glaucoma, and diabetic retinopathy.

Subjects and Methods: This was an observational cross-sectional study performed on 580 from the general population from different cities in Saudi Arabia over a nine-month period from August 2018 to April 2019. Data was collected through a semi-structured questionnaire and was applied on a Google form. Awareness was defined as whether the respondent had ever heard of the disease.

Results: The study sample was 580 participants, 85% were above 45 years old, and the majority were female (71.4%). This study reported good knowledge of participants about cataract, diabetic retinopathy and glaucoma (84.1 %, 57.2% and 71.1%) while there was poor knowledge regarding age-related macular degeneration with statistically significant differences between them with the best knowledge in all aspects about cataract (p value <0.001).

Conclusion: The Saudi population who are 45 years or older had relatively good knowledge about diseases such as cataract, DR and glaucoma while they had poor knowledge about macular degeneration.

Key words: Cataract, Diabetic retinopathy, glaucoma, knowledge

Introduction

Visual impairment is one of the most important medical problems of the general population with an expected 253 million individuals suffering worldwide; about 36 million are blind. Glaucoma (12.3%), age-related macular degeneration (AMD) (8.7%), corneal opacities (5.1%) and diabetic retinopathy (4.8%) are other main causes of visual impairment [1].

The prevalence of blindness among the population aged 50 years and older in Saudi Arabia in 2010 was (3.3%) [2], 5.8% prevalence of glaucoma [3]. Cataract is responsible for 52.6% of blindness and 20.6% of visual impairment in the southwestern region of Saudi Arabia, considering one of the most common age-related eye diseases [4].

Age related eye disease such as Macular Degeneration, Cataracts, Glaucoma and Diabetic Retinopathy take time to develop with the person's age; these diseases are common in old age and threaten their ability to live alone and increases the risk of accidents [5].

Eye diseases, like too many chronic conditions such as diabetes and hypertension, are usually asymptomatic in the early stages, until the disease has progressed. However, eye diseases are generally ignored while those with other chronic diseases are usually monitored regularly [6].

Cognitive impairment is an important cause of morbidity in elderly persons. Some studies have reported associations between reduced visual acuity and poor cognitive function, but few have investigated the specific vision threatening eye diseases that may be associated with cognitive impairment. The current evidence on the relation between age-related eye diseases and cognitive impairment is still limited. In contrast other studies report that age-related eye diseases such as cataract, diabetic retinopathy (DR), and glaucoma are associated with poorer cognitive tests cores and higher prevalence of cognitive dysfunction [7].

Although cataract is considered one of the multifactorial diseases that have a genetic, socio-demographic, behavioral or environmental basis, age is still the single most effecting risk factor for cataract [8].

Age-related macular degeneration (AMD) is one of the macular diseases that is characterized by marked gradual visual impairment and the major cause of central visual loss, as it is resulted from neuro-degeneration of the photoreceptor–retinal pigment epithelial complex which with late onset, affects 10% of people older than 65 years [9].

In Saudi Arabia, AMD represents 3.3% of the major causes of blindness in individuals older than 50 years [10]. Patients' knowledge is relevant to the prevention of blindness, as most of the age-related eye diseases are treatable conditions and can be prevented or cured in almost 80% of conditions [11]. However, lack of awareness about sight-threatening eye diseases may contribute to the delay of seeking medical advice and losing the opportunity of management and prevention. So increasing awareness of these conditions will have a great effect in minimizing the burden of visual impairment and cost-effectiveness of eye care [12,13].

As far as our knowledge, the Saudi population has poor knowledge about age-related eye disease and its risk factors [4]. This study was a part of a community-based survey conducted to evaluate the knowledge and awareness of the Saudi Arabian population in the western region regarding old age related eye diseases i.e. cataract, glaucoma, and diabetic retinopathy.

Patients and Methods

Study design: This is a cross-sectional survey-based study aimed to to evaluate the knowledge and awareness of the Saudi Arabian population regarding old age related eye disease.

Time frame: The study was conducted over a nine-month period from August 2018 to April 2019.

Sampling methodology: This study was undertaken from the general population, who were above 45 years of age, in the western region of Saudi Arabia. Five hundred and eighty (580) participants were enrolled in the study. People who were not mentally or physically able to communicate, as well as those who did not consent to participate in the study were excluded from the study.

Sample size was estimated using EPI INFO (Epidemiological Information Package) version (21) assuming that the frequency was (20%) at a confidence interval of 95 % and power of 80%. The Sample was conventional sample; selection of sample was done when sample size had been completed, and the application form closed.

Study instrument: Data was collected from study participants using a semi-structured questionnaire, applied in a Google form that had been loaded on the internet. The questionnaire included questions about demographic characters, awareness, attitudes and practice with regard to visual impairment in general and about the most prevalent age-related eye diseases in Saudi Arabia (glaucoma, cataract and diabetic retinopathy).

Pilot study: A pilot study was carried out (10% of the sample size - 50subjects) to evaluate the validity and reliability of the questionnaire applied on participants. Based on the result of the pilot study some modifications and rearrangement of some questions were done. The results of the pilot study were not included in the final data analysis. Validation of the questionnaire was made as follows: the questionnaires were translated using a back-translation technique. An expert translated the original questionnaire from English into Arabic. Arabic version of the questionnaires was translated back into English by a bilingual individual. The back-translated and original versions of the questionnaire were compared with attention given to the meaning and grammar.

Semi-structured questionnaire included five boxes obtained from Katibeh et al., [14] and Lee et al [6]:

(1) The first box included socio-demographic characteristics such as Age, sex, education, employment, residency and insurance and other questions about participants' attitudes and practice with regard to visual impairment in general, and included six questions: Have you ever had any visual problem?, Have you ever been prescribed spectacles for near or far visual impairment?, Which types of spectacles do you wear consistently?, Has an ophthalmologist visited you so far?, Do you have history of major ophthalmologic treatment including surgery, laser or medical therapy?, How does vision loss affect your daily performance?.

(2) The second box included five close-ended questions about the participants' knowledge about cataract (hearing about cataract, definition of cataract, source of information, effect of it and if it is treatable or not). (3) The last three boxes each included six close-ended questions about the participants' knowledge about diabetic retinopathy, glaucoma and age-related macular degeneration (hearing about disease, definition of it, source of information, effect of it, if it is treatable or not and first presentation). Awareness was defined as whether the respondent had ever heard of the disease.

Ethical considerations: Ethical approval for this study was obtained from the ethical review committee of the college. The nature of the study was fully explained to the study participants and formal online web page consent was obtained from each participant before they filled out the questionnaire. All participants could respond at their convenience and available time and their privacy was assured.

Data analysis: The collected data were coded, entered, presented, and analyzed by computer using a data base software program, Statistical Package for Social Science (version 20, SPSS Inc., Chicago, IL). Quantitative variables were expressed as the mean ± standard deviation (Mean ± SD), while the qualitative variables were expressed as a number and percentage. For quantitative variables, independent samples t-test (t) was used as appropriate for normally distributed data. Chi square test was used to detect the relation between different qualitative variables. The results were considered statistically significant when the significant probability was (p-value < 0.05).

Results

This study was a cross sectional study which included 580 participants from both sexes and different areas to assess the knowledge about different eye diseases. Most of the participants were above 45 years and the majority of them (71.4%) were females. About 80% had university education and unemployed participants were (54.8%). Most of the participants had no insurance coverage (64.5%) as described in Table 1 and Figure 1.

Regarding general vision care practice of the participants, about (44.8%) had no eye problems and nearly half of them (49.3%) did not wear spectacles. Only 7.6% mentioned that they have problems in near and/or far vision (combined problem). Most of the participants did not have ophthalmology surgery before (74.8%). To approximate the attitude of participants toward eye health care, they were asked how much visual loss would affect their daily performance. About 37.1% of the participants believed that vision loss would mainly affect their daily performance, 23.8% believed it would be a moderate effect and 11.9% believed in a minimal effect; an unexpected, 27.2% believed that vision loss would have no effect on their daily performance as shown in Table 2.

Regarding knowledge of participants about the age related disease, about 84.1 % of the participants had positive awareness about cataract and most of them obtained their information from family members or friends and magazines (31.7% & 30.9%) and 44.8% knew it is a blinding disease and 75.7% knew that it can be treated (Table 3).

Regarding awareness of diabetic retinopathy, nearly more than half of the participants (57.2%) had positive awareness, 55.2% knew it is a blinding disease and 53.7% knew that it can be treated as shown in Table 4. While 71.2 % of the participants had positive awareness about glaucoma, 39.8% knew it is a blinding disease and 55.7% knew that it can be treated (Table 5).

About 82.1 % of the participants had not heard about macular degeneration, 22.6% knew it is a blinding disease and 18.3% knew that it can be treated (Table 6).

There were highly statistically significant differences regarding the knowledge about the four eye diseases (cataract, diabetic retinopathy, glaucoma and macular degeneration) with the best knowledge in all aspects about cataract (p value <0.001) (Table 7).

Table 1: Basic characteristics of the studied group (n=580)

Basic characteristics	Study group (n=580)	
	No	%
Age		
>=45	493	85
<45	87	15
Total	**580**	**100.0**
Sex		
Male	166	28.6
Female	414	71.4
Total	**580**	**100.0**
Education		
University	466	80
High school	92	15.9
Intermediate	5	0.9
Elementary	14	2.4
Non educated	3	0.5
Total	**580**	**100.0**
Employment		
Unemployed	318	54.8
Employed	188	32.4
House wife	46	7.9
Retired	28	4.8
Total	**580**	**100.0**
Insurance		
No insurance	374	64.5
Complete	92	15.9
Partial	114	19.7
Total	**580**	**100.0**

Figure 1: Distribution of the studied group over different areas

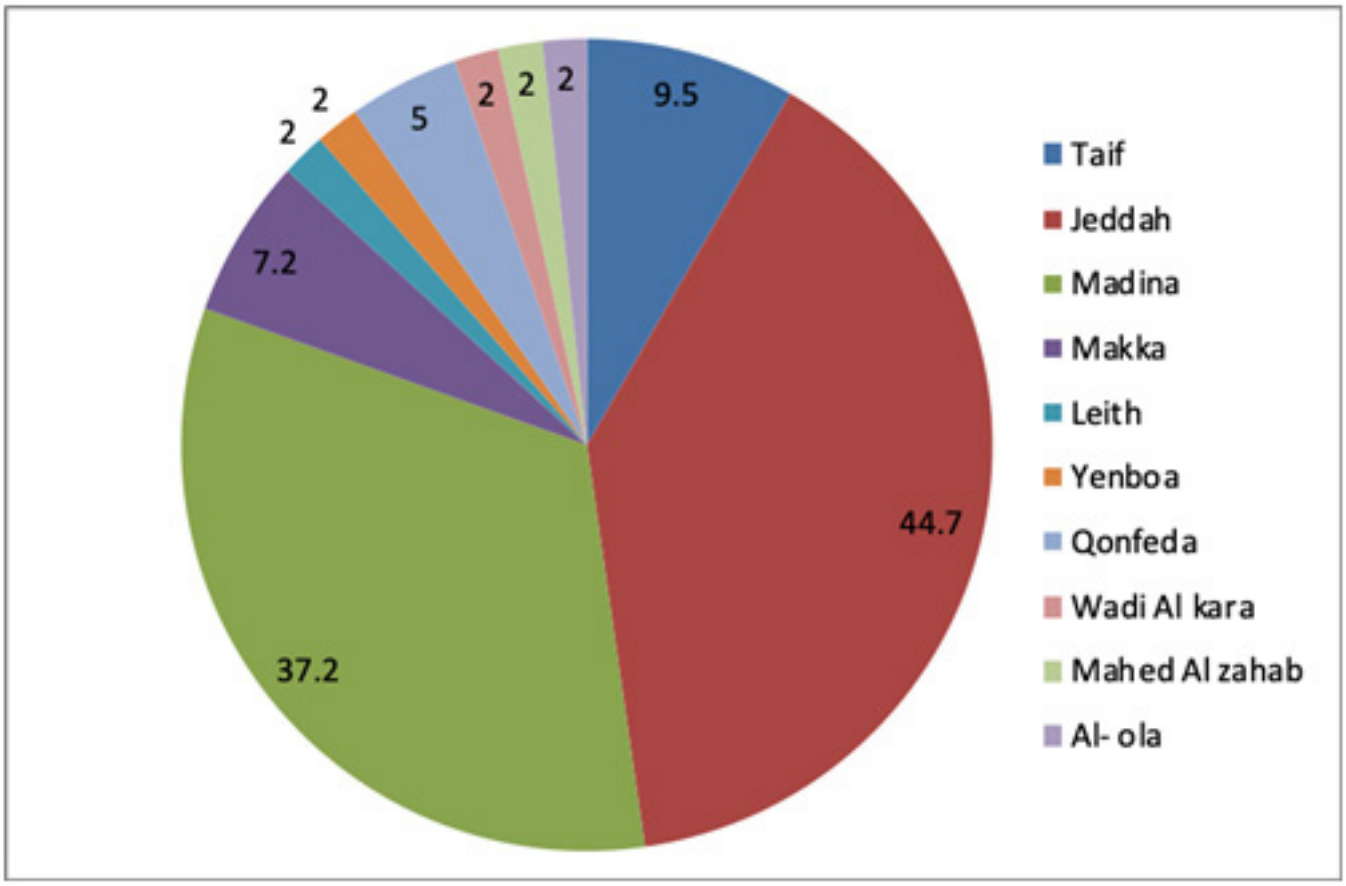

Table 2: Medical characteristics concerning vision of the studied group

Visual characteristics	Study group (n=580)	
	No	%
Visual problems		
For near vision	166	28.6
For far vision	96	16.6
Combined problem	58	10.0
No problem	260	44.8
Total	**580**	**100.0**
Visual spectacles		
For near vision	152	26.2
For far vision	98	16.9
Combined problem	44	7.6
No problem	286	49.3
Total	**580**	**100.0**
Type of Visual spectacles		
For near vision	140	24.1
For far vision	87	15.6
Combined problem	33	5.7
No problem	320	55.2
Total	**580**	**100.0**
Ophthalmology visit		
Yes, eye problem	240	41.4
Yes, for check up	72	12.4
No need	67	11.6
No, Financial reason	166	28.6
No, Limited time	25	4.3
No, other reason	10	1.7
Total	**580**	**100.0**
Ophthalmic surgery		
Yes	146	25.2
No	434	74.8
Total	**580**	**100.0**
Daily performance		
Very high	120	20.7
High	95	16.4
Intermediate	138	23.8
Low	69	11.9
No	158	27.2

Table 3: Knowledge about cataract among the studied group

Items	Study group (n=580)	
	No	%
Awareness (heard about cataract)		
Yes	488	84.1
No	92	15.9
Total	**580**	**100.0**
Definition		
White spot in the eye	50	8.6
It is a white pupil	89	15.3
Opacity of the lens	203	35.0
Any changes in eye lens which make it unclear or white	99	17.1
Visual loss due to a covering shield in front of light rays	45	7.8
Don't know	94	16.2
Total	**580**	**100.0**
Source of your information about cataract		
Ophthalmologist	94	16.2
Family members or Friends	184	31.7
General Practitioner	39	6.7
Optometrist	5	9.0
Medical Staff	17	2.9
Media	62	10.7
Books or Magazines	179	30.9
Total	**580**	**100.0**
What is the worst effect of cataract?		
Blindness	260	44.8
Low Vision	156	26.9
Pain	8	1.4
Cosmetic Problems	7	1.2
Other	69	11.9
Blurriness	80	13.8
Total	**580**	**100.0**
Is cataract a treatable condition?		
Yes	490	75.9
No	6	1.0
Don't know	31	23.1
Total	**580**	**100.0**

Table 4: Knowledge about diabetic retinopathy among the studied group

Items	Study group (n=580)	
	No	%
Awareness (heard about Diabetic retinopathy)		
Yes	332	57.2
No	248	42.8
Definition		
It is a preventable side effect of diabetes or high blood sugar on eyes	160	27.6
It is a side effect of diabetes on posterior parts of eye	80	13.8
Any damage of retinal vessels in diabetic patients	48	8.3
A vision threatening condition caused by high blood sugar	156	26.9
Don't know	136	23.4
Total	**580**	**100.0**
Source of your information about DR		
Ophthalmologist	79	13.6
Family members or Friends	116	20.0
General Practitioner	35	6.0
Optometrist	3	5.0
Medical Staff	24	4.1
Media	59	10.2
Books or Magazines	264	45.5
Total	**580**	**100.0**
What is the worst effect of cataract?		
Blindness	320	55.2
Low Vision	111	19.1
Pain	16	2.8
Cosmetic Problems	6	1.0
Other	127	21.9
Total	**580**	**100.0**
Is diabetic retinopathy a treatable condition?		
Yes	207	35.7
No	66	11.4
Don't know	307	52.9
Total	**580**	**100.0**
What is the first presentation of DR in most cases?		
Visual loss	49	8.4
Pain	55	9.5
It may start without any alarming symptoms or signs	102	17.6
Other	129	22.2
Blurring vision	245	42.2
Total	**580**	**100.0**

Table 5: Knowledge about glaucoma among the studied group

Items	Study group (n=580)	
	No	%
Awareness (heard about glaucoma)		
Yes	413	71.2
No	167	28.2
Total	**580**	**100.0**
Definition		
High pressure of the eye	203	35
An eye disease which limits the visual field	54	9.3
An eye disease which damages the optic nerve	39	6.7
Increasing the internal liquid of eye	150	25.9
Don't know	134	23.1
Total	**580**	**100.0**
Source of your information about glaucoma		
Ophthalmologist	81	14.0
Family members or Friends	151	26.0
General Practitioner	39	6.7
Optometrist	6	1.0
Medical Staff	16	3.1
Media	67	11.6
Books or Magazines	218	37.6
Total	**580**	**100.0**
What is the worst effect of glaucoma?		
Blindness	231	39.8
Low Vision	132	22.8
Pain	47	8.1
Cosmetic Problems	11	1.9
Other	159	27.4
Total	**580**	**100.0**
Is glaucoma a treatable condition?		
Yes	323	55.7
No	23	5.5
Don't know	225	38.8
Total	**580**	**100.0**
What is the first presentation of glaucoma in most cases?	57	9.8
Visual loss	83	14.3
Pain	90	15.5
It may start without any alarming symptoms or	162	27.9
signs	188	32.4
Other	**580**	**100.0**
Blurring vision		
Total		

Table 6: Knowledge about macular degeneration among the studied group

Items	Study group (n=580)	
	No	%
Awareness (heard about macular degeneration)		
Yes	104	17.9
No	476	82.1
Total	**580**	**100.0**
Definition		
Don't know	247	42.6
Degenerative condition affecting the central part of the retina	183	31.6
High pressure of the eye	38	6.6
An eye disease which limits visual field	112	19.3
Total	**580**	**100.0**
Source of your information about macular degeneration		
Ophthalmologist	50	8.6
Family members or Friends	54	9.3
General Practitioner	20	3.4
Optometrist	5	0.9
Medical Staff	23	4.0
Media	31	5.3
Books or Magazines	397	68.9
Total	**580**	**100.0**
What is the worst effect of macular degeneration?		
Blindness	125	21.6
Low Vision	82	14.1
Pain	32	5.5
Cosmetic Problems	23	4.0
Other	318	54.8
Total	**580**	**100.0**
Is macular degeneration a treatable condition?		
Yes	106	18.3
No	37	6.4
Don't know	437	75.3
Total	**580**	**100.0**
What is the first presentation of macular degeneration in most cases?		
Visual loss	35	9.1
Pain	55	9.5
It may start without any alarming symptoms or signs	59	10.2
Other	310	53.4
Blurring vision	103	17.8
Total	**580**	**100.0**

Table 7: Comparing Knowledge about different eye diseases among the studied group

Knowledge	Cataract No %	Diabetic retinopathy No %	Glaucoma No %	Macular degeneration No %	p-value
Awareness	488(84.1)	332 (57.2)	413(71.2)	104(17.9)	<0.001*
Definition of the disease	302(52.0)	160 (27.7)	203(35.0)	183(31.6)	<0.001*
Realized it as a blinding disease	260(44.8)	320 (55.2)	231 (39.8)	125(21.6)	<0.001*
Realized the disease as a treatable condition	490(75.9)	207 (35.7)	323(55.7)	106(18.3)	<0.001*

* Highly significant p <0.05 Chi square test

Discussion

The burden of age-related eye diseases can be reduced to a great extent through promoting the knowledge of common eye problems among the general population [15]. Therefore, this study was carried out mainly to assess the knowledge and awareness among the old aged towards common eye diseases in Saudi Arabia.

This study included 580 participants from both sexes and different areas in Saudi Arabia. Most of the participants were above 45 years and most of them (71.4%) were females and the majority had university education.

In this study, about 27.2% believed that vision loss would have no effect on their daily performance while in a study done by Katibeh et al [14], to assess general awareness and knowledge regarding cataract, glaucoma and DR, it found 8.4% believed that vision loss would have no effect on their daily performance at all.

Regarding knowledge of participants about the age related disease, about (84.1 %) of the participants had positive awareness about cataract 57.2% about DR, 71.1% about glaucoma and 17.9% about age-related macular degeneration. Al-Lahim et al [16] found that the awareness among study participants was 64.6% regarding cataract, 77.3% about DR and 67.5% regarding glaucoma while, Lee et al [6] found the average awareness rate over the 3-year study period was 23.69% in subjects with cataract and 1.45% in subjects with age-related macular degeneration and in Katibeh et al [14], awareness regarding glaucoma, cataract and DR was 46.6%. In Bihar (India), 60.3% of the subjects were not aware of glaucoma [17]. Shrestha et al [18] observed the awareness of cataract among 49.6%, and diabetic retinopathy among 29% of the Nepal population.

Regarding cataract as one of the most common age-related eye diseases, in this study about 35% knew that it is opacity of the eye lens, 44.8% confirmed that it may lead to vision loss and almost 75.9% had information that it is a treatable disease. This is not agreed with in a study done by Magliyah et al [4], who reported poor awareness in Makkah region about cataract, as most of participants (72.4%) did not know that cataract is an increase in the opacity of the lens and 78% did not know that cataract can lead to blindness and about two-thirds of them (65.9%) did not know that it is treated surgically when it affects vision, while Alghamdi et al [19], reported great numbers (85%) of the studied population had known that surgical intervention is the recommended treatment of cataract.

The difference in the degree of the awareness rates between cataract and other diseases might be due to differences in the nature of symptoms and patient recognition of each disease, as cataract is more frequently detectable because blurriness is an easily recognized symptom [20].

In the current study, 55.7% were aware that untreated glaucoma could lead to loss of vision while it was observed in 45.1% of the participants in a study done by Al-Lahim et al [16]. In a study done in India, knowledge about glaucoma was observed in only 41% of the participants [21].

Increasing awareness of the studied participants about diabetic retinopathy in the current study is based on the high prevalence of diabetes shown previously among the Saudi adult population, as many Saudi families had at least one member withdiabetes (e.g., first, second, or third degree relatives). Therefore, many efforts have been done toward population health promotion about diabetes in Saudi Arabia, which was mainly supported by the Ministry of Health and other health-related sectors [22].

Regarding medical staff as a source of information for the population in Saudi Arabia, we reported 2.9% about cataract, 4.1% DR, 3.1% glaucoma and 4% macular degeneration. It is observed that there is a gap between health-care providers and the Saudi population which may be due to presence of barriers between the population and health care as the health-care system, including sociocultural barriers, educational barriers, environmental barriers, financial barriers, geographical barriers and health status barriers [4].

In this study, there was poor knowledge regarding age-related macular degeneration with statistically significant differences with other age-related eye disease with (p value <0.001). This may be explained as age-related macular degeneration is not a very common disease in the community in Saudi Arabia [23]. Hence, this result may indicate that there was a great gap of eye public awareness, especially regarding macular degeneration.

Limitations
One of the limitations of this study was using a questionnaire for collecting data which is prone to recall bias, and being a cross-sectional study it showed the relation between variables without concluding a cause-effect relationship.

Conclusion

In conclusion, the Saudi population who are 45 years or older had relatively good knowledge about diseases such as cataract, DR and glaucoma while they had poor knowledge about macular degeneration and efforts should be made to increase the knowledge and aware¬ness of the disease. Efforts should be made to increase understanding and acceptance of the importance of routine eye examination for early detection and treatment of such conditions, thereby reducing visual impairment and the cost of eye care and need to increase contact between population and medical staff will provide a greater chance of detecting eye disease.

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