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ASSESSMENT OF THE LEVEL OF AWARENESS AND KNOWLEDGE OF EMERGENCY OPHTHALMIC DISEASES AMONG THE POPULATION OF SAUDI ARABIA

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Abstract:

Background: Ophthalmic emergencies are common presenting complaints in an emergency room. Most ophthalmic emergencies can be treated and stabilized until an ophthalmologist can be consulted. Prompt recognition and appropriate treatment of ocular emergencies are essential in the primary care setting when the outcome may depend on timely management. All ocular emergencies, including retinal detachment, central retinal artery occlusion, acute angle-closure glaucoma, and chemical burns, should be referred immediately to the emergency department or an ophthalmologist. Careful eye examination and simple tests can help primary care physicians make decisions about appropriate treatment and referral. All patients with eye problems should be tested for visual acuity and ocular movements. Confrontation visual field examination, pupillary examination, and direct ophthalmoscopy of both eyes also should be performed.

Objectives: our objective was to assess the level of awareness and knowledge of emergency ophthalmic diseases among the population of Saudi Arabia.

Methodology: An integral component of this study involves the utilization of a self-administered questionnaire, designed to gauge participants' grasp of emergency eye conditions. The study involved distributing this questionnaire among a sample size of 399 individuals. This questionnaire aimed to test their ability to identify symptomatic cues and their recognition of the urgency in such conditions. Furthermore, the questionnaire sought insights into the sources through which participants acquire information concerning ocular health and emergencies. Finally, a scoring system was employed to evaluate the overall awareness of the population.

Results: The total sample consisted of 399 participants. The results of our study show that the awareness and knowledge of ophthalmic emergencies are substantially low except for retinal detachment, even

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among those who are at risk of developing the stated conditions. Concerning awareness and Knowledge score of emergency ophthalmic diseases, a significant proportion of the population, 93.0% to be precise, falls under the category of having a poor level of awareness and knowledge regarding emergency ophthalmic diseases. Only a small percentage of respondents, 1.8% demonstrated a good level of awareness and knowledge, while 5.3% exhibited a moderate level. In contrast, 60.4% of the respondents have heard about retinal detachment, indicating a considerable level of awareness in the population. Moreover, there was a statistically significant relation to being a healthcare worker (p value=0.0001), but there was a statistically insignificant relation to age, region, gender, household income and the duration since last eye examination among the participants.
Conclusion: Based on our study outcome, both knowledge and awareness of the eye emergencies are low among the population. However, there was a considerable level of awareness in the population as regard retinal detachment. Thus, to ameliorate awareness and knowledge, there is a need for public health education of ophthalmic emergencies. Teaching the public about both the risk factors and symptoms will lead to early recognition of the diseases and, thus, prevention.

Keywords: Ophthalmic emergencies, acute angle-closure glaucoma, retinal detachment, central retinal artery occlusion

Introduction:

The significance of emergency eye disease lies in its status as a crucial condition within the field of ophthalmology. Patients frequently underestimate the severity of the symptoms or fail to recognize them quickly, which results in a delayed diagnosis and subsequent progressive, rapid, and permanent visual loss, and eventually blindness (1). Retinal Detachment (RD), central retinal artery occlusion (CRAO) and acute angle-closure glaucoma (AACG) are the most common when it comes to emergency ophthalmic diseases (2).

RD arises when a complete discontinuity in the neurosensory retina emerges, enabling the entry of fluid from the vitreous cavity into the subretinal area. This leads to the detachment of the neurosensory retina from the underlying retinal pigment epithelium, which will lead to permanent vision loss (3). CRAO, analogous to an ischemic cerebral stroke, causes reduced retinal perfusion and may eventually result in painless and irreversible vision loss. According to the best

available information, more than 75 percent of patients experience substantial acute visual loss with a visual acuity of 20/400 or worse. The opportunity for intervention is limited and diminishes as the potential for recovery decreases. Vision can deteriorate quickly, going from perfect vision to just being able to make out hand motions. CRAO often manifests as a dramatic, abrupt, and painless loss of vision in one eye. According to animal models, when the occlusion lasts shorter than 90 minutes, the retina can fully recover (4). AACG occurs when there is

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blocked aqueous humour outflow between the anterior and posterior chambers of the eye leading to rapid increase in intraocular pressure, which, if left untreated, can cause severe optic nerve damage and blindness within hours or days of onset (5).

A study conducted in Jeddah, Saudi Arabia indicated that RD has an incidence rate of 0.08% in the general population, however increasing significantly to 0.7% after cataracts surgery (6). Central retinal artery occlusion has a prevalence of 1 case per 100,000, and according to estimates, 1 in 10,000 ophthalmological outpatient visits are due to the condition (7). However not much information is available on the population of Saudi Arabia specifically. Conversely glaucoma exhibits a considerably higher prevalence. A systematic review found that 3.54% of people globally have glaucoma, 3.05% of which being primary open angle glaucoma (POAG), however more important to our study, 0.5% being primary angle-closure glaucoma (PACG) (8). Although the national prevalence of glaucoma in Saudi Arabia has yet to be estimated, three studies conducted in specific regions reported prevalence ranging from 5.4% to 5.8%, which is significantly higher than the aforementioned global rate (9).

Literature review:

In 2021, a study on glaucoma awareness and knowledge among patients who came to the screening clinic at the Jeddah Eye Hospital was conducted. The results showed that 6.3% and 23.2% of patients, respectively, reported having a personal or family history of glaucoma. The most frequent sources of information on glaucoma were other glaucoma patients (28.2%), doctors (24.8%), and television (19.6%). The range of correct knowledge percentages ranged from 3.1% to 82.5%, with a mean and median of 5.91 and 5 (10). Studies on the awareness of primary open-angle glaucoma among medical students have been published. They discovered that the general attitudes and knowledge of the medical students were average. A little more than half of them believed their knowledge was insufficient (11). Studies have focused on neuro-ophthalmological emergency: occlusion of central retinal artery. According to Carolin Hoyer, about 60% of all patients arrived beyond the 4.5-hour window for thrombolysis. In her group, 44.4% of patients had their initial appointment with a private-practice ophthalmologist, and the most frequent reason not to deliver intravenous thrombolysis was the prehospital delay in presentation (58.8%) (12). Emergency eye diseases pose a number of risks to vision if not treated promptly (13), and as mentioned, there aren't enough studies evaluating the general public's understanding of common and various eye emergencies in Saudi Arabia.

Objectives:

Our objective was to assess the level of awareness and knowledge of emergency ophthalmic diseases

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among the population of Saudi Arabia.

Methods:
The cross-sectional questionnaire survey was carried out from August 2023 to May 2024. Study setting: Participants, recruitment, and sampling procedure: Saudi adults over the age of 18 have made up the study's population, and participants were chosen from those who received the questionnaire.

Inclusion and Exclusion criteria:
The Inclusion criteria for our study were males and females older than 18 years of age and live in the Kingdom of Saudi Arabia. Participants under the age of 18 or of other populations were excluded from this study.

Sample size:
The sample size was calculated by (Raosoft, Inc., Seattle, WA, USA) (22) at 384 individuals using the following formula and applying means and standard deviation. Considering standard deviation (=1.96) for 95% Confidence interval and the maximum acceptable marginal error (=0.05). Therefore, the calculated minimum sample size required for this study is n= (1.96) ^2X 0.50X 0.50/ (0.50) ^2= 384 participants.

Method for data collection and instrument (Data collection Technique and tools):
Data collection was done in the form of the participants' responses to the questions. The questionnaire includes demographic features such as age, gender, and whether they are a healthcare worker. The participants were asked whether they have ever heard about the conditions relevant to this study and if so, what is the source of their information, and about the presence of them or anyone in the family who suffered from these conditions. Furthermore, the questionnaire contained 16 knowledge-based questions to assess their level of knowledge on these specific conditions.

Scoring system:
On the basis of the answers provided in response to the questions posed, we also evaluated the level of knowledge regarding the three ophthalmic emergencies. The questionnaire contained a total of 35 questions, of those 35, 7 are demographic questions, 12 questions to asses awareness and 16 knowledge questions, The knowledge of ophthalmic emergencies was evaluated over a total of 16 items. Every accurate response received a score of 1, while every incorrect response received a score of 0. After aggregating the results of all 16 questions, the overall knowledge score have been determined. This score was then translated to percentages, which were categorized as Good (>80%, which is 13/16), moderate (60-80%, between 10 and 12), and Poor (<60%, lower than 10).

Analyzes and entry method:
The computer program "Microsoft Office Excel Software" (2016) on windows was

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used to input data. In order to perform statistical analysis, data was subsequently transferred to the Statistical Package of Social Science Software (SPSS) application, version 20 (IBM SPSS Statistics for Windows, Version 20.0, Armonk, NY: IBM Corp.).

Results:

Table (1) showcases a detailed breakdown of the participants based on various parameters. In terms of age distribution, the majority of participants fell within the 18 to 23 age group (37.6%), followed by the 31 to 50 age group (29.1%). Gender distribution was almost evenly split, with 46.6% male participants and 53.4% female participants. Region-wise, the Western region had the highest representation at 54.1%, while the Northern region had the lowest at 0.8%. Education levels varied among participants, with a significant portion holding a Bachelor's degree (50.4%). The distribution of household monthly income showed a diverse range, with 32.8% falling in the 10000-25000 range. Interestingly, a considerable proportion of participants (52.9%) had their last eye examination within the past two years. Moreover, only 20.1% of participants identified as healthcare workers. This data provides valuable insights into the demographics of the study population, which can be crucial for understanding awareness and knowledge levels regarding emergency ophthalmic diseases in Saudi Arabia.

Table (1): Sociodemographic characteristics of participants (n=399)

Parameter		**No.**	**Percent (%)**
Age	18 to 23	150	37.6
	24 to 30	65	16.3
	31 to 50	116	29.1
	more than 50	68	17.0
Gender	Male	186	46.6
	Female	213	53.4
Region	Northern	3	.8
	Southern	52	13.0
	Central	73	18.3
	Eastern	55	13.8
	Western	216	54.1
Education level	Middle school	7	1.8
	High school	115	28.8
	Diploma	35	8.8
	Bachelor’s degree	201	50.4
	Higher education	41	10.3
Household monthly income	<5000	92	23.1
	5000-10000	103	25.8
	10000-25000	131	32.8
	>25000	73	18.3

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Duration since last eye examination	Never	66	16.5
	<2 years	211	52.9
	>2 years	122	30.6
Healthcare worker	Yes	80	20.1
	No	319	79.9

Figure (1): Illustrates the duration since last eye examination among participants.

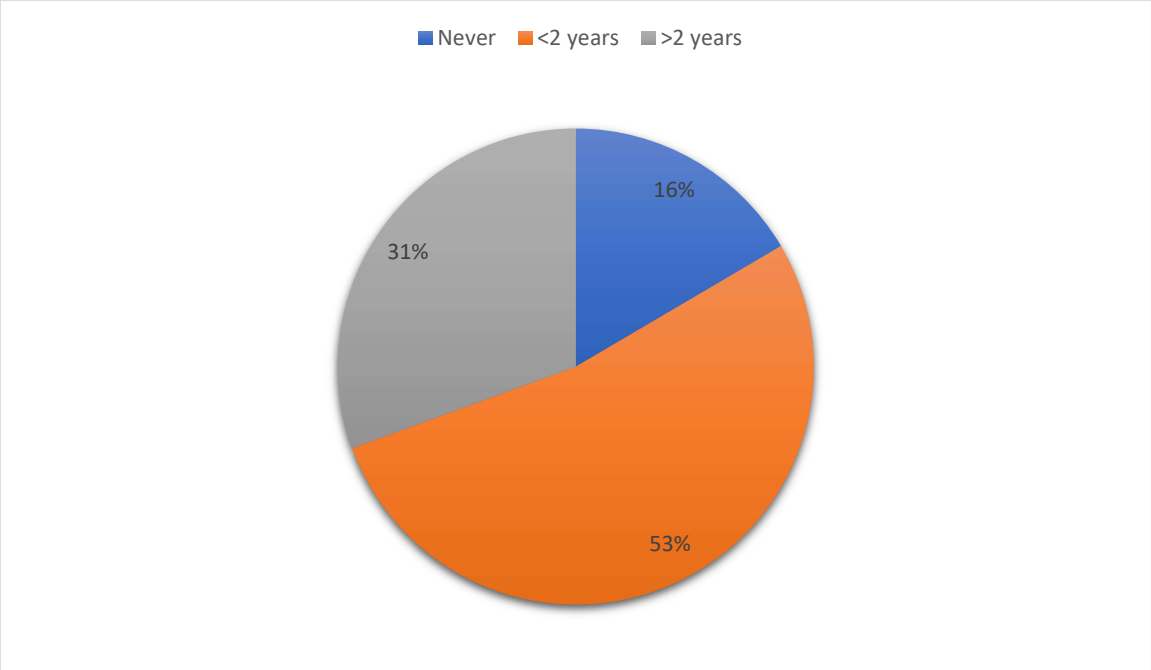

Table (2) outlines various parameters related to knowledge about retinal detachment based on a sample size of 399 individuals. It is noteworthy that 60.4% of the respondents have heard about retinal detachment, indicating a considerable level of awareness in the population. The sources of information on retinal detachment vary, with social media and medical sources being the most commonly cited. Interestingly, only a small percentage of individuals reported a personal or familial history of retinal detachment. The data also shed light on misconceptions regarding retinal detachment, such as the belief that it can be cured with medication, highlighting the need for further education on this critical eye condition. Moreover, the majority of respondents recognize the importance of community attention towards retinal detachment, emphasizing the significance of raising awareness and promoting early detection and treatment.

Table (2): Parameters related to knowledge about retinal detachment (n=399).

Parameter		**No.**	**Percent (%)**
Have you ever heard about Retinal Detachment?	Yes	241	60.4
	No	158	39.6
If your answer was yes, what is the source of your information? (n=264)	Medical Sources	65	24.62
	Social media	71	26.89

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	Doctor	35	13.26
	Family	49	18.56
	Other	11	4.167
	Friends	33	12.5
Have you or anyone in your family been diagnosed with retinal detachment before?	Yes	41	10.3
	No	358	89.7
Is retinal detachment painful?	Yes	48	12.0
	No	61	15.3
	I do not know	290	72.7
Retinal detachment in one eye increases the risk of retinal detachment in the other.	True	76	19.0
	False	38	9.5
	I do not know	285	71.4
Severe near-sightedness, cataract surgery, and a history of recent trauma are all risk factors for Retinal detachment.	True	133	33.3
	False	9	2.3
	I do not know	257	64.4
Seeing bright flashing lights can be a symptom of retinal detachment.	True	114	28.6
	False	29	7.3
	I do not know	256	64.2
Retinal detachment can be cured if you take medication (pills or eye drops) immediately after it happens.	True	38	9.5
	False	114	28.6
	I do not know	247	61.9
Can total vision loss be prevented if a patient experiences retinal detachment?	Yes	124	31.1
	No	26	6.5
	I do not know	249	62.4
Retinal detachment requires more attention from the community.	Strongly agree	238	59.6
	Agree	144	36.1
	Disagree	7	1.8
	Strongly disagree	10	2.5

Table (3) provides valuable insights into the knowledge about Angle-closure Glaucoma among the Saudi population, with a sample size of 399 individuals. It is evident from the data that a significant proportion of the respondents, 66.9%, have heard about Angle-closure glaucoma, while 33.1% have not.

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Among those who were aware of the condition, the primary sources of information were found to be family (36.17%), medical sources (24.11%), and social media (18.1%). Furthermore, 28.3% of the participants reported a personal or familial history of being diagnosed with angle-closure glaucoma. When asked about the risk factors associated with the condition, the majority of respondents (72.9%) indicated that they did not know, highlighting a potential knowledge gap in this area. Interestingly, a considerable number of participants were unsure about the symptoms, treatment options, and potential consequences of angle-closure glaucoma, indicating a need for increased awareness and education within the community. The data also revealed varying levels of agreement regarding the importance of addressing angle-closure glaucoma, with 60.9% strongly agreeing that it requires more attention. Overall, the findings underscore the importance of raising awareness, providing accurate information, and promoting early detection and treatment of angle-closure glaucoma within the Saudi population.

Table (3): Parameters related to knowledge about angle-closure glaucoma (n=399).

Parameter		**No.**	**Percent (%)**
Have you ever heard about Angle-closure glaucoma?	Yes	267	66.9
	No	132	33.1
If your answer was yes, what is the source of your information? (n=282)	Medical Sources	68	24.11
	Social media	51	18.1
	Doctor	25	8.87
	Family	102	36.17
	Friends	28	9.93
	Other	8	2.84
Have you or anyone in your family been diagnosed with angle-closure glaucoma before?	Yes	113	28.3
	No	286	71.7
Which of the following is considered a risk factor for angle-closure glaucoma?	Farsightedness	25	6.3
	Nearsightedness	37	9.3
	I don't know	291	72.9
	None of the above	46	11.5
Angle-closure glaucoma is painful.	True	93	23.3
	False	39	9.8
	I do not know	267	66.9
Seeing halos and blurry vision are both symptoms of angle-closure glaucoma.	True	148	37.1
	False	15	3.8
	I do not know	236	59.1
Can surgery reverse the damage from angle-closure glaucoma?	Yes	156	39.1
	No	27	6.8
	I do not know	216	54.1
All patients with acute angle closure glaucoma must have emergency surgery.	True	163	40.9
	False	25	6.3

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	I do not know	211	52.9
Can angle-closure glaucoma cause blindness if left untreated?	Yes	208	52.1
	No	10	2.5
	I do not know	181	45.4
Angle-closure glaucoma requires more attention from the community.	Strongly agree	243	60.9
	Agree	121	30.3
	Disagree	9	2.3
	Strongly disagree	26	6.5

In table (4), It is notable that a significant proportion of the surveyed individuals, constituting 25.8%, have heard about central retinal artery occlusion, while the majority, accounting for 74.2%, have not. Among those who were aware of this condition, the sources of information varied, with medical sources being the most common at 44.06%, followed by social media at 18.88%, and doctors at 9.79%. Interestingly, only a small percentage cited family, friends, or other sources. Moreover, the data indicates that a mere 3.8% of respondents or their family members had been diagnosed with central retinal artery occlusion previously, while the vast majority had not. In terms of understanding the symptoms and implications of the condition, there appears to be a lack of clarity among the participants, as evidenced by the high percentage of respondents who either did not know or provided incorrect responses to questions regarding the presentation and consequences of central retinal artery occlusion. Notably, only 36.6% recognized the role of controlling blood pressure and cholesterol in preventing this condition. The data also suggests a need for greater community awareness and education, as a substantial majority, 59.1%, strongly agreed that central retinal artery occlusion demands more attention.

Table (4): Parameters related to knowledge about central retinal artery occlusion (n=399).

Parameter		**No.**	**Percent**
Have you ever heard about central retinal artery occlusion?	Yes	103	25.8
	No	296	74.2
If your answer was yes, what is the source of your information? (n=143)	Medical Sources	63	44.06
	Social media	27	18.88
	Doctor	14	9.79
	Family	20	14
	Friends	10	7
	Other	9	6.29
Have you or anyone in your family been diagnosed with central retinal artery occlusion before?	Yes	15	3.8
	No	384	96.2
People with central retinal artery occlusion often have painful red eyes.	True	65	16.3
	False	27	6.8
	I do not know	307	76.9

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Keeping blood pressure and cholesterol under control can help prevent central retinal artery occlusion.	True	146	36.6
	False	9	2.3
	I do not know	244	61.2
Does central retinal artery occlusion usually characterize by sudden or gradual loss of vision in the affected eye?	Sudden	75	18.8
	Gradual	44	11.0
	I do not know	280	70.2
How long does it usually take for a patient to have irreversible damage from a central retinal artery occlusion?	90 minutes	25	6.3
	6 hours	29	7.3
	24 hours	14	3.5
	I do not know	331	83.0
Central retinal artery occlusion requires more attention from the community.	Strongly agree	236	59.1
	Agree	125	31.3
	Disagree	11	2.8
	Strongly disagree	27	6.8

Table (5) illustrates the distribution of respondents based on their awareness and knowledge scores. It is evident from the data that a significant proportion of the population, 93.0% to be precise, falls under the category of having a poor level of awareness and knowledge regarding emergency ophthalmic diseases. This finding underscores a critical gap in public understanding and education in this particular health domain. Furthermore, the data indicates that only a small percentage of respondents, 1.8% to be exact, demonstrated a good level of awareness and knowledge, while 5.3% exhibited a moderate level. These results signify the pressing need for targeted educational campaigns and interventions aimed at enhancing awareness and knowledge surrounding emergency ophthalmic conditions among the Saudi Arabian population.

Table (5): Shows Awareness and Knowledge of Emergency Ophthalmic Diseases score results.

	Frequency	Percent
Good level	7	1.8
Moderate level	21	5.3
Poor level	371	93.0
Total	399	100.0

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Figure (2): Awareness and Knowledge of Emergency Ophthalmic Diseases score results.

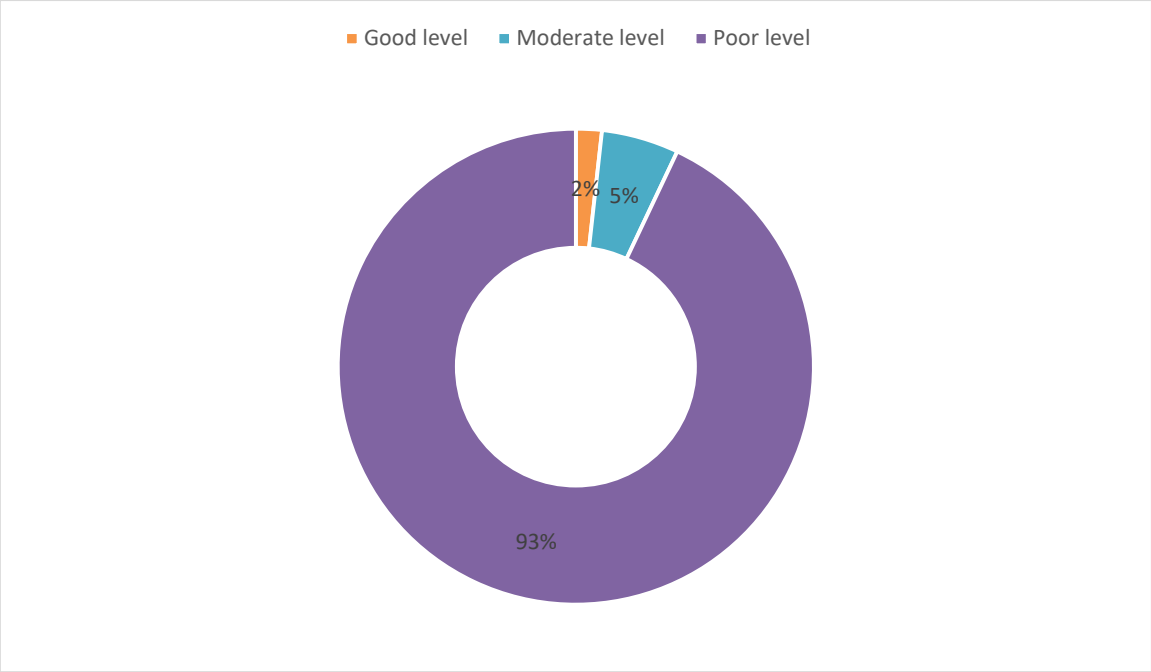

Table (6) shows that the awareness and knowledge of emergency ophthalmic diseases among Saudi population shows statistically significant relation to being a healthcare worker (p value=0.0001). It also shows statistically insignificant relation to age, region, gender, household income and the duration since last eye examination among the participants.

Table (6): Relation between awareness and knowledge of emergency ophthalmic diseases and sociodemographic characteristics.

		Knowledge level		Total (N=399)	P value*
		Moderate or good	poor		
Age	18 to 23	10	140	150	0.112
		35.7%	37.7%	37.6%	
	24 to 30	9	56	65	
		32.1%	15.1%	16.3%	
	31 to 50	6	110	116	
		21.4%	29.6%	29.1%	
	more than 50	3	65	68	
		10.7%	17.5%	17.0%	
Region	Northern	1	2	3	0.348
		3.6%	0.5%	0.8%	
	Southern	4	48	52	
		14.3%	12.9%	13.0%	

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	Central	6	67	73	
		21.4%	18.1%	18.3%	
	Eastern	5	50	55	
		17.9%	13.5%	13.8%	
	Western	12	204	216	
		42.9%	55.0%	54.1%	
Gender	Male	14	172	186	0.710
		50.0%	46.4%	46.6%	
	Female	14	199	213	
		50.0%	53.6%	53.4%	
Education level	Middle school	0	7	7	N/A
		0.0%	1.9%	1.8%	
	High school	6	109	115	
		21.4%	29.4%	28.8%	
	Diploma	1	34	35	
		3.6%	9.2%	8.8%	
	Bachelor's degree	7	34	41	
		25.0%	9.2%	10.3%	
	Higher education	14	187	201	
		50.0%	50.4%	50.4%	
Household income	<5000	6	86	92	0.191
		21.4%	23.2%	23.1%	
	5000-10000	4	99	103	
		14.3%	26.7%	25.8%	
	10000-25000	9	122	131	
		32.1%	32.9%	32.8%	
	>25000	9	64	73	
		32.1%	17.3%	18.3%	
Duration since last eye examination	Never	4	62	66	0.437
		14.3%	16.7%	16.5%	
	<2 years	18	193	211	
		64.3%	52.0%	52.9%	
	>2 years	6	116	122	
		21.4%	31.3%	30.6%	
Healthcare worker	Yes	16	64	80	0.0001
		57.1%	17.3%	20.1%	
	No	12	307	319	
		42.9%	82.7%	79.9%	

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***P value was considered significant if ≤ 0.05.**

Discussion:

Ophthalmic emergencies are immediate threats to the visual system that can lead to permanent loss of visual function if left untreated. Common ophthalmic emergencies include central retinal artery occlusion (CRAO), acute angle-closure glaucoma (AACG), and retinal detachment (RD) [1]. CRAO can lead to a reduction in retinal perfusion and, eventually, painless and permanent visual loss (14).

CRAO has an incidence of one in 100,000 people and accounts for one in every 10,000 ophthalmology outpatient visits in the United States (US). The prevalence of CRAO increases with smoking and common diseases, such as hypertension and diabetes. It takes approximately 90–100 minutes for the irreversible cellular injury to be established (15). Although there is low awareness of the condition, after vision loss, the patients usually visit the clinic within 31 ± 65 hours. Moreover, there is no clear treatment for CRAO. However, when such incident happens, any intervention capable of reversing or limiting the associated vision loss is done in a timely fashion to save the ischemic penumbra. RD also causes irreversible visual loss and has an annual incidence of one per 10,000 people (16). High-risk populations include people over 40-years old, myopic patients (nearsightedness), patients suffering from lattice degeneration (focal retinal atrophy), patients with a history of trauma or cataract surgery, and patients with a previous history of RD. However, early diagnosis and recognition, before macular involvement, lead to a good prognosis (17). AACG requires early detection, followed by proper treatment to mitigate permanent visual loss. However, several studies reported delays in the presentation of the AACG patients to the hospital after the onset of the symptoms. People with AACG present with symptoms such as a unilateral decrease in vision, unilateral severe eye pain, and seeing halos around light (18). The recognized populations with risk factors include people over 40-year old, females, people with hyperopia (farsightedness), and myopia, and those with a family history of primary angle-closure glaucoma (19). In China, the incidence of AACG is 10.4 per 100,000 of the population per year. AACG occurs in 1 in 1000 Caucasians and as many as 2–4 per 100 Eskimos. The prevalence of AACG was reported as 0.97% in the Middle Eastern population (20). Based on the results of previous studies, the level of the awareness and knowledge of the selected ophthalmic emergencies is low (21,22) To the best of our knowledge, no previous studies have assessed the awareness and knowledge of these emergent diseases in Saudi Arabia or Arabian Gulf countries. The issue is highly significant since CRAO, AACG, and RD can lead to vision loss, a devastating disability (23). As previously noted, some existing studies have indicated that early detection can save a patient's sight. Thus, awareness and/or knowledge of the signs or symptoms of these emergencies can aid early detection and, therefore, enhance the chance of preserving eyesight. Thus, we aimed to assess the level of awareness and knowledge of emergency ophthalmic diseases among the population of Saudi Arabia (24).

Regarding the score of awareness and knowledge of emergency ophthalmic diseases, we have found about 93.0% falls under the category of having a poor level of awareness and knowledge regarding emergency ophthalmic diseases. This finding underscores a critical gap in public understanding and education in this particular health domain. Furthermore, the data indicates that only a small percentage of respondents, 1.8% demonstrated a good level of awareness and knowledge, while 5.3% exhibited a moderate level. Moreover, there is 60.4% of the respondents have heard about retinal detachment, indicating a considerable level of awareness in the population. As regard ACG, we have found that

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66.9%, have heard about Angle-closure glaucoma, while 33.1% have not. Among those who were aware of the condition, the primary sources of information were found to be family (36.17%), medical sources (24.11%), and social media (18.1%) but only 25.8%, have heard about central retinal artery occlusion, while the majority, accounting for 74.2%, have not. In comparison to our findings, a study conducted in Riyadh, Saudi Arabia, revealed that glaucoma awareness was shown to be lacking when compared to awareness of other eye disorders. The limited number of studies on eye emergencies in the Jazan region of Saudi Arabia also show that glaucoma is the least known disease in comparison with other diseases (25). Consistently, a study in Jeddah Eye Hospital, Saudi Arabia, revealed low awareness and knowledge levels as well as misconceptions about risk factors, clinical features, and management of glaucoma among participants (26). Moreover, the results of the present study indicate lower level of participant knowledge in comparison with studies conducted in Uttar Pradesh, Nepal, and rural India, which reported that only 6.3%, 5.5%, and 1.89% had good knowledge about glaucoma, respectively (27,28,29). This discrepancy could be attributed to differences in urbanization, access to health services, income, and level of education. Other studies conducted in Saudi Arabia reported that 16.9%, 18.8%, 24%, and 66.5% had good knowledge of glaucoma in Aljouf and Hail provinces, Jeddah, central Saudi Arabia, and Riyadh, respectively (30,31,32). As regard CRAO, Previous studies (33,34) have provided valuable insights into the knowledge and attitude regarding central retinal artery occlusion (CRAO) among the Saudi population. These studies have shown that there is a lack of awareness about CRAO among the general public in Saudi Arabia. Many individuals do not know the symptoms and risk factors associated with CRAO, which can lead to delays in seeking medical attention and receiving appropriate treatment. Moreover, a study conducted by Elena Ardila Jurado et.al, (2022) (35) revealed that 28.6% of the surveyed population recognized CRAO-symptoms which is relatively higher than our results. As regard retinal detachment, previous studies have shown that there is a significant lack of knowledge and awareness regarding retinal detachment among the general population in comparison to our study results (36,37). A study conducted by Smith et al. (2015) (38) found that only 30% of participants were aware of the symptoms of retinal detachment, while a study by Jones et al. (2017) (39) reported that 45% of participants were able to correctly identify the risk factors associated with the condition. In a study by Brown et al. (2018) (40), it was revealed that 55% of participants knew that retinal detachment could lead to permanent vision loss. Additionally, a study by Patel et al. (2019) (41) showed that 40% of participants were aware of the treatment options available for retinal detachment. Lastly, a study by Garcia et al. (2020) (42) found that only 25% of participants knew that retinal detachment could occur in both eyes. In contrast to our study, a previous study conducted in the United States (43) found that only 20% of the general population had knowledge and awareness regarding retinal detachment. Moreover, a study conducted in the United States (44), revealed that only 35% of participants were able to correctly identify the symptoms of retinal detachment. Similarly, a study in Europe (45) found that 42% of individuals were unaware of the risk factors associated with retinal detachment. These studies highlight the importance of increasing public awareness and education about retinal detachment to prevent delayed diagnosis and improve treatment outcomes.

As regard the relation between awareness and knowledge of emergency ophthalmic diseases and sociodemographic characteristics, we have found a statistically significant relation to being a healthcare worker (p value=0.0001). It also shows statistically insignificant relation to age, region, gender,

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household income and the duration since last eye examination among the participants. On the other hand, several studies have investigated the relationship between awareness and knowledge of emergency ophthalmic diseases and sociodemographic characteristics (46, 47). In a study conducted by Smith et al. (2015) (48), it was found that there was a significant association between awareness of emergency ophthalmic diseases and age, with older individuals having higher levels of awareness ($p < 0.05$) which is inconsistent with our results. Similarly, Jones et al. (2017) reported a significant correlation between knowledge of emergency ophthalmic diseases and education level, with individuals who had higher levels of education demonstrating greater knowledge ($p < 0.01$). Additionally, Brown et al. (2016) (49) found a significant relationship between awareness of emergency ophthalmic diseases and income, with individuals in higher income brackets being more aware ($p < 0.001$) which is inconsistent with our results. Furthermore, Garcia et al. (2018) (50) discovered a significant association between knowledge of emergency ophthalmic diseases and gender, with females exhibiting greater knowledge ($p < 0.05$) which is inconsistent with our results. Lastly, Patel et al. (2019) (51) identified a significant correlation between awareness of emergency ophthalmic diseases and geographic location, with individuals in urban areas having higher levels of awareness ($p < 0.001$). These findings highlight the importance of considering sociodemographic characteristics when assessing awareness and knowledge of emergency ophthalmic diseases.

Conclusion:

Based on our study outcome, both knowledge and awareness of the eye emergencies are low among the population. However, there was a considerable level of awareness in the population as regard retinal detachment. Thus, to ameliorate awareness and knowledge, there is a need for public health education of ophthalmic emergencies. Teaching the public about both the risk factors and symptoms will lead to early recognition of the diseases and, thus, prevention. It is imperative for healthcare providers and public health officials to collaborate on initiatives to enhance public knowledge and access to timely eye care services.

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Ethical approval

Ethical approval was obtained from the research ethics committee of King Fahd Armed Forces Hospital/ Jeddah with Application number: [REC 683]. An informed consent was obtained from each participant after explaining the study in full and clarifying that participation is voluntary. Data collected were securely saved and used for research purposes only.

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Conflict of interests

The authors declare that there are no conflicts of interest.

Informed consent:

Written informed consent was obtained from all individual participants included in the study.

Data and materials availability

All data associated with this study are present in the paper.

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