RESEARCH ARTICLE

AWARENESS AND KNOWLEDGE TOWARDS COMMON EYE DISEASES OF CITIZENS IN MEDINA CITY, SAUDI ARABIA

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Manuscript Info	*Abstract*

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Objective: The study aimed to assess the extent of knowledge regarding common eye diseases namely cataracts, diabetic retinopathy, glaucoma, refractive errors, and eye traumas among citizens of Medina City, Saudi Arabia.

Subjects and Methods: A total of 288 citizens (≥18 years old) of Medina city were selected and asked to answer online questionnaires regarding their knowledge on common eye diseases. The questionnaire includes demographics, awareness, and source of information of eye diseases.

Results: Overall, the 283 participants have obtained a good mean general knowledge on cataract, strabismus, and refractive error, while nearly intermediate mean general knowledge about diabetic retinopathy and glaucoma. Knowledge scores of the participants were found to be highest for cataract (64.25 ± 27.6), while lowest for glaucoma (47.76 ± 34.3). The common source of information regarding eye disease were their family members and friends (33.3%, n=96). In term of socio-demographic factors, male gender was found to be the common factor that significantly influence the awareness of participants towards cataract, retinopathy, glaucoma, and refractive errors, while presence of eye problem was observed to significantly influence the knowledge of respondents towards retinopathy, glaucoma, and strabismus.

Conclusion: This study concludes that proper and extended awareness and knowledge, such as creating health programs and effective health education, towards eye diseases must be imposed to help mitigate the cases of eye health diseases.

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Introduction:-
Visual impairment is a very well-known global health problem.

Awareness of eye diseases, knowledge, attitude and practice play a major role in preventing most of visual complications associated with eye conditions if they have been identified and treated early. Only limited information, however, is available on studies regarding awareness on visual impairment among population of Medina City in Saudi Arabia. This study aimed to assess the extent of knowledge regarding common eye diseases such as cataracts, diabetic retinopathy, glaucoma, refractive errors, and eye traumas among citizens of Medina, Saudi Arabia.

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Subjects and Methods:-

Study design

This cross-sectional study involved 283 men and women of Medina City Saudi Arabia. The study included citizens 18 years old and above from the period of February to June 2021. They were given questionnaires that was done via an online survey.

Statistics

Data were collected and interpreted. It was the analyzed using IBM SPSS version 23 IBM SPSS version 23 (IBM Corp., Armonk, N.Y., USA). A simple descriptive statistics was used to define the characteristics of the study variables through a form of counts and percentages for the categorical and nominal variables while continuous variables are presented by mean and standard deviations. To establish a relationship between categorical variables, this study used chi-square test. To measure the knowledge on each eye diseases a scoring system was used by converting the responses to correct and incorrect answer, which represent 1 and 0 respectively. A simple additive method was used and converted the total score for each eye disease into a hundred-point scale. The questions involve are the following:

General knowledge about cataract
1. What is the worst effect of cataract?
2. Is cataract a treatable condition?
3. What is the first presentation of cataract in most cases?
4. Cataract has an effect on sight
5. Cataract has an effect on social life
6. Cataract has an effect on the family

General knowledge about diabetic retinopathy
1. What is the worst effect of diabetic retinopathy?
2. Is diabetic retinopathy a treatable condition?
3. What is the first presentation of diabetic retinopathy in most cases?
4. Diabetic retinopathy has an effect on sight
5. Diabetic retinopathy has an effect on social life
6. Diabetic retinopathy has an effect on the family

General knowledge about glaucoma
1. What is the worst effect of glaucoma?
2. Is glaucoma a treatable condition?
3. What is the first presentation of glaucoma in most cases?
4. Glaucoma has an effect on sight
5. Glaucoma has an effect on social life
6. Glaucoma has an effect on the family

General knowledge about refractive error
1. What is the worst effect of refractive errors?
2. Is refractive error a treatable condition?
3. What is the first presentation of refractive errors in most cases?
4. Refractive errors have an effect on sight
5. Refractive errors have an effect on social life
6. Refractive errors have an effect on the family

General knowledge about strabismus
1. What is the worst effect of strabismus?
2. Is strabismus a treatable condition?
3. What is the first presentation of strabismus in most cases?
4. Strabismus has an effect on sight
5. Strabismus has an effect on social life
6. Strabismus has an effect on the family

In comparing the score to demographics and other indicator an independent t-test was used for two group means and One-way ANOVA, with Least Significant Difference (LSD) as a post hoc test was used for more than two groups. These tests were done with the assumption of normal distribution. Otherwise, Welch's t-test for two group means was used as an alternative test. Dependent study variables were defined as a binary outcome. A Binary Logistic Regression Model (BLRM), with Backward Conditional Elimination with Enter Criteria=0.05 and Elimination=0.10 was used to determine the significant predictors of any given dependent study variables with 95% confidence intervals. Also General Linear Model Univariate Analysis was used to identify significant predictors for dependent variables represented by mean using a Main Effect model. Lastly, a conventional p-value <0.05 was the criteria to reject the null hypothesis.

Ethics
This study was approved by MOH Ethics Committee .Informed consents (written and verbal) were also obtained from the participants.

Results:-
In this cross-sectional study, assessment of common eye diseases was conducted on 288 people in Medina City, including 82 men (28.5%) and 206 women (71.5%). Table 1 shows characteristics of the participants who answered the online questionnaire. Majority of the respondents attained a "university" educational level (72.2%). On the other hand, majority of the population are students (43.1%) and employed (34.7%).

Eye assessment of the participants show that 35.1% of them were experiencing eye problems. Moreover, thirty-seven respondents (12.8%) have answered that they have existing systemic health problem. Most patients have prevailing family history of eye problems (56.6%) and systemic health problem (59.0%). Meanwhile, 199 respondents (69.1%) were found to have visited an ophthalmologist before but only 112 respondents (38.9%) have done an ophthalmic treatment.

Several types of eye diseases were identified, and respondents were asked on the extent of their knowledge about these diseases (Table 2). Patients' knowledge on cataract, diabetic retinopathy, glaucoma, refractive errors, and strabismuswere determined. Two hundred forty-two respondents(93.4%) are aware that it is a treatable condition, and 244 of them were aware that it has an effect on sight (94.2%). Nearly two-third (62.5%,n = 180) of the respondents have common knowledge on diabetic retinopathy but mostly were aware that it has an effect on eye sight (97.8%, n = 176). Majority of the respondents were also aware of glaucoma (68.1%, n = 196) and mostly were also aware that it has an effect on eye sight (89.8%, n = 176). Almost similar rate with diabetic retinopathy, about two-third of respondents (62.8%, n = 179) have heard about refractive errors, with high proportion of them knowing that it is has an effect on eye sight (93.9%, n = 168), and it is a treatable condition (89.9%, n = 161). Strabismus is another common eye disease among Saudi Arabians, having almost all the respondents to be aware about this eye condition (98.3%, n = 283). Out of these participants, 80.6% (n = 228) had knowledge that it has an effect on social life. Collectively, the 283 participants have obtained a good mean general knowledge on cataract, strabismus, and refractive error (Table 3). Particularly, cataract was the most well-known eye disease among studied eye problems, having a mean 64.25 ± 27.6 (min = 0, max = 100) general knowledge about it. This was followed by strabismus with a mean general knowledge of 62.07 ± 24.3 (min = 0, max = 100), and refractive error having mean general knowledge of 54.65 ± 39.9 (min = 0, max = 100) . On the other hand, the respondents had an almost intermediate mean general knowledge about diabetic retinopathy (49.82 ± 35.1, min = 0, max = 100) and glaucoma (47.76 ± 34.3, min = 0, max = 100).

Table 4 shows data on sources of information about eye diseases. According to the participants, they obtain most common knowledge from family members or friends (33.3%, n = 96), followed by ophtalmologits (22.9%, n = 66), and books or magazines (21.5%, n = 62). Meanwhile, only 2.4% (n = 7) of the participants agreed that they learned about common eye diseases from an optometrist.

The association between participant's eye problem knowledge and socio-demographic characteristics was then evaluated. Results revealed significant differences on the cataract awareness of respondents relative to gender (P 0.013) and history of visit to ophthalmologist (P 0.033) according to Chi-square analysis. More specifically, significantly higher proportion of male (82.9%, n = 68) and female (92.7%, n = 191) have heard about cataract compared to those who have not, and significantly higher proportion of both genders (male: 8$.3%, n = 75; female: 92.5%, n = 184) visited an ophthalmologist before compared to who were not. Binary logistic regression model

shows that male gender is the most significant socio-demographic factor that has correlation with cataract awareness (P 0.023). No significant differences (P > 0.05) were observed on the general cataract knowledge of the respondents against the socio-demographic factors. On the other hand, significant differences were also found on the retinopathy awareness of participants with respect to gender (P < 0.001), age (P 0.026), educational level (P 0.001), occupation (P 0.034), history of ophthalmologist visit (P 0.023) and ophthalmic treatment (P 0.025) using Chi-square test at 0.05 level. Further analysis using binary logistic regression model revealed that male gender (P < 0.001), 18 - 29 years old (P 0.014) and 30 – 49 years old (P 0.025) age groups, high school and below educational attainment (P 0.002), unemployed/student/retired occupation (P 0.011), and no history of any ophthalmic treatment have the most significant correlation with retinopathy awareness of the respondents. On the other hand, significant differences were observed on the general retinopathy knowledge of the respondents against the socio-demographic factors such as having a systemic health problem (P 0.006) according to Independent t-test, and presence of systemic health problem in the family (P 0.001) based on LSD. Test of between-Subjects Effects shows that presence of systemic health problem among the participants (P 0.019, F = 5.573, Adjusted R^2 = 0.092) and in their family (P 0.002, F = 6.433, Adjusted R^2 = 0.092) were the most significant factors associated with general knowledge of participants towards retinopathy. When it comes to glaucoma, significant differences were found on the glaucoma awareness of the respondents relative to gender (P 0.001), age (P 0.023), educational level (P 0.027), and history of any ophthalmic treatment (P 0.011). Analysis using binary logistic regression model showed that male gender (P 0.001), high school and below educational level (P 0.020), and history of any ophthalmic treatment (P 0.018) were the most significant socio-demographic factors associated with participant's awareness on glaucoma. Also, significant differences on the glaucoma knowledge of the respondents were observed relative to the educational level (P 0.006), and presence of eye problem (P 0.022). Test of Between-Subjects Effects showed that both the educational level (P 0.011, F = 6.635, R^2 0.049), and presence of eye problem (P 0.022, F = 4.332, R^2 = 0.049) were the most significant socio-demographic factors associated with general knowledge of participants towards glaucoma. With regards to assessment of refractive errors, Chi-square test revealed significant differences in the refractive error knowledge of the respondents with respect to socio-demographic factors such as gender (P 0.001), age (P 0.001), marital status (P 0.001), and occupation (P 0.023). Using binary regression model, it was observed that male gender (P 0.0010, B = - 0.906, Exp (B) = 0.235 – 0.695), and single marital status (P 0.0012, B = 0.81, Exp (B) = 1.351 – 3.742) in particular, were the most significant socio-demographic factors associated with the awareness on refractive errors of the participants. However, results revealed no significant differences (P > 0.05) in the general knowledge about refractive errors of the participants relative to all socio-demographic factors. For the eye condition, strabismus, no significant differences (P > 0.05) were found about the response of the participants when they were asked if they heard about it, regardless of socio-demographic factors. The association between general knowledge about strabismus and socio-demographic factors was also assessed. Results showed significant differences in the strabismus general knowledge of the respondents relative to factors such as educational level (P 0.004) and presence of eye problem (P 0.018) according to independent t-test, and occupation (P 0.002) based on Welch's t-test. Analysis using Tests of Between-Subjects Effects revealed that educational level (P 0.012, F = 6.366, R^2 = 0.057), occupation (P 0.019, F = 5.541, R^2 = 0.057), and presence of eye problem (P 0.037, F = 4.385, R^2 = 0.057), were the most significant socio-demographic factors associated with the general knowledge of participants towards strabismus.

Discussion:-

The population size of 288 involved participants of citizens from Medina city ages 18 and up and most of them are in the bracket of 18-29 years old. Demographics also showed that most of the respondents are female (71.5%) and only 28.5% are male. Majority of the participants were found to be females. According to a study made by Waleed, et. Al in 2017, it was known that females are relatively more knowledgeable in common eye diseases.[1] More than half of them are single (59.9%) while 38.3% are married. Majority or 72.2% went up to university level for educational attainment while mostly are students and employed. From this, it can be inferred that the respondents who participated enough were literate and have sufficient knowledge about the very basic terms of eye diseases.

While it was known that visual impairments usually occur on ages >30years old, it is still also relevant that the population included in this study are in the 18-29 age bracket. This is to raise awareness in that age group to make an early detection leading to prevention and faster cure of some eye diseases. People beyond 50 years old compose more than 80% of the population with visual impairment.[2] Consequence of auto-immune diseases like diabetis mellitus in relation to the effect on the eye should be discussed to decrease risk of acquiring impairment and development of other conditions such as age-related macular degenaration, retinopathy and glaucoma.[3] Education and literacy also play an important role in the awareness of the eye diseases.[4]

The most common source of information of the respondents regarding common eye diseases came from family members and friends. Ophthalmologist also played a big role in the information dissemination. Books and magazine came in as third main source of data. While media, general practitioner and optometrist played the least part on the awareness of common eye diseases respectively.

The most common eye disease in terms of overall general knowledge is cataract, with 64.25% of the total participants recognizing the disease, the sources and effects. The least commonly known disease was found to be glaucoma with only 47.76% acknowledging the said visual disability. In summary, close to half of the total respondents have shown ample and equal knowledge about different common eye diseases. Data can be justified as some of the eye diseases mentioned above are not exactly visible to the eye. This however, only signifies that further spread of lectures on the awareness of common eye diseases must be done because not even the majority of the respondents displayed enough knowledge on it.

Most of the respondents that participated in the study are in the bracket age of 18-29. The study does not provide enough information on the more critical age bracket of 30 years old and up, the stage where most common visual impairment start to occur. The study suggest to study further on the awareness of common eye diseases specify the age bracket, focusing on the critical age of 30 years old above to determine if citizens of that age bracket are aware of occurrence of certain diseases. With this, health and wellness discussion should also include the relevance of eye screening. According to a study made by Al-Alawi, et. al, in 2016, this is important most especially for patients woth long-standing diabetes.[5] Together with raising awareness is changing the perception towards receiving proper healthcare in order to reduce extensive cases of visual impairments. It was also found that mobile screenings are found to be effective and can be implemented to developing countries such as Saudi Arabia.[6]

This study concludes that proper and extended awareness must be done to consequently bring understanding and acceptance that a regular eye check-up could highly prevent occurrence of eye diseases and visual impairment. It also suggests focusing on the 30 years and beyond age bracket for the information dissemination since this is the age when common eye diseases start to form. The data generated in this study could also help develop correct approach on creating health programs and effective health education in order to prevent and lessen visual loss among the study population.

Tables:
Table 1:- Socio-demographic characteristics of the studied population (N = 288).

Demographics		Count	%
Total		288	100.0
Gender	Male	82	28.5
	Female	206	71.5
Age	18-29 years old	195	67.9
	30-49 years old	77	26.8
	50 years old and more	15	5.2
	Missing	1	
Area of residency	Medina	288	100.0
Marital status	Single	172	59.9
	Married	110	38.3
	Divorced	3	1.0
	Widowed	2	0.7
	Missing	1	
Education level	Illiterate	2	0.7
	Elementary	2	0.7
	High school	52	18.1
	Intermediate	6	2.1
	University	208	72.2
	Postgraduate	18	6.3
Occupation	Unemployed	54	18.8
	Student	124	43.1
	Self-employed	5	1.7

Employed	100	34.7	
Retired	5	1.7	

Table 2:- General knowledge towards eye diseases on the studied population.

Eye Disease General Knowledge	Cataract		Diabetic Retinopathy		Glaucoma		Refractive Errors		Strabismus	
	Count	%	Count	%	Count	%	Count	%	Count	%
Total	259	100.0	180	100.0	196	100.0	179	100.0	283	100.0
Knowledgeable on worst effect	148	57.1	130	72.2	126	64.3	142	79.3	108	38.2
Is it a treatable condition?	242	93.4	128	71.1	146	74.5	161	89.9	208	73.5
What is the first presentation of this condition in most cases?	119	45.9	54	30.0	27	13.8	138	77.1	105	37.1
It has an effect on sight	244	94.2	176	97.8	176	89.8	168	93.9	213	75.3
It has an effect on social life	163	62.9	131	72.8	145	74.0	130	72.6	228	80.6
It has an effect on the family	138	53.3	123	68.3	131	66.8	116	64.8	192	67.8

Table 3:- Sources of information of common eye diseases of the studied population.

Source of your information		Count	%
From the following items, which one is the main source of your information?	Ophthalmologist	66	22.9
	Family members or Friends	96	33.3
	General Practitioner	13	4.5
	Optometrist	7	2.4
	Media	44	15.3
	Books or Magazines	62	21.5

Table 4:- Mean general knowledge scores on common eye diseases of the studied population.

Variables	N	Min	Max	Mean	SD
General knowledge about cataract	283	0.00	100.00	64.25	27.6
General knowledge about diabetic retinopathy	283	0.00	100.00	49.82	35.1
General knowledge about glaucoma	283	0.00	100.00	47.76	34.3
General knowledge about refractive error	283	0.00	100.00	54.65	39.9
General knowledge about strabismus	283	0.00	100.00	62.07	24.3

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