

Knowledge and Awareness About Age-Related Macular Degeneration Among Students of the Syrian Private University

Taim Shamous¹, Karam Obeid¹, Afraa Salman²

¹Faculty of medicine, Syrian Private University

²Associate Professor, Faculty of Medicine, Syrian Private University, Damascus University

*Corresponding Author:

Taim Shamous, Faculty of medicine, Syrian Private University

Submitted: 23 Dec 2022; Accepted: 30 Dec 2022; Published: 20 Feb 2023

Citation: Shamous T, Obeid K, Salman A. (2023). Knowledge and Awareness About Age-Related Macular Degeneration Among Students of the Syrian Private University. *J Vet Heal Sci*, 4(1), 26-34.

Abstract

Background: A significant contributing factor to permanent blindness is age-related macular degeneration (AMD), hence raising awareness of the condition is crucial to preventing blindness. Previous research papers, however, indicated that the general public is not aware of AMD, and there is no information available regarding AMD awareness in Syria. Therefore, the purpose of our study was to assess the awareness of AMD and its risk factors Syrian Private University students.

Methods: A cross-sectional study using a questionnaire focused on students from the medical, dental, pharmacy, business administration, and engineering schools at a Syrian private university. The interview assessed respondents' knowledge of AMD using a standardized questionnaire derived from the AMD Alliance International Global Report. Demographic data included age, gender, education level, and home type (rural vs. urban).

Results: The 600 students from the Syrian Private University made up the sample for our study, including 252 males (59%) and 248 females (41%). 35% of the total student population—responded that age-related macular degeneration is very common and able-to-detect early, moreover 34% of students responded that macular degeneration is a common cause of irreversible low vision in the world. 16%, 18%, 18% and 13% believed that smoking, diabetes, high blood pressure, and obesity are risk factors for AMD. When the students were asked about the potential symptoms of AMD, the majority of students responded that the patient's low vision was the most significant symptom, reaching 253 students, or 42%. When asked about treatment options for AMD, the majority of participants showed low level of knowledge about that.

Conclusion: The sample of students knew very little about AMD. It is necessary to implement educational initiatives to increase public knowledge about AMD

Introduction

According to a 2004 World Health Organization report, age-related macular degeneration (AMD) was responsible for 8.7% of blindness worldwide and was the leading cause of permanent blindness in the elderly [1]. AMD affects 15.5% of individuals in China who are 50 years of age or older, and it is predicted that this number will rise as China's population ages [2].

Significant advancements have been achieved in the diagnosis and treatment of this condition in recent decades [3]. For example, intravitreal injections of antiangiogenic medicines have completely changed how neovascular AMD is managed today [3]. While the majority of patients can have their visual acuity stabilized or even

improved with these treatments, the success of these treatments depends heavily on the early detection of neovascular lesions before significant retinal damage has occurred. In addition, a number of risk factors, such as smoking, family history of AMD, cardiovascular disease, risk factors (such as body mass index [BMI], hypertension, and hypercholesterolemia), and ocular risk factors (in particular iris color, cataract surgery, and refractive errors), have been studied in epidemiologic studies. For instance, smoking and a family history of AMD have demonstrated extremely significant relationships with AMD, but other risk factors have yielded less consistent results [3, 4]. Additionally, it has been determined that more than 50 genetic variations are linked to AMD [5].

But nearly all of the earlier research showed that people were not aware of AMD [6, 7]. In 2005, the AMD Alliance International conducted a nationwide study in 14 countries that revealed knowledge of AMD ranging from 4% to 30%, with the greatest levels in the USA and less than 10% in Japan and Hong Kong [8]. In a separate survey of the Chinese community in Hong Kong, it was discovered that 90% of participants had never heard of AMD and that only 0.2% of them could accurately define its symptoms and etiology [9].

Knowing the risk factors for AMD, especially those that can be changed, will make it easier for patients to take specific preventative measures before the illness manifests. Age, genetics, and smoking have all been regularly included as risk factors for AMD to date, with smoking being the only one with confirmed modifiable risk. However, the AMD Alliance International Global Report 2005 showed that smoking was not widely acknowledged as a risk factor for AMD. The percentage of respondents who knew about AMD was just 32%. More than half of the participants in eight of the fourteen countries studied were unaware that smoking could impair vision [8]. Comparable findings were made among Singaporeans. Just 36.7% of respondents knew that smoking was linked to AMD [10].

The purpose of this study was to determine how well-aware Syrian Private University students were of AMD and its risk factors and treatment options.

Methods: Study Setting

Students from the schools of medicine, dentistry, pharmacy, business administration, and engineering at private Syrian universities were the focus of a cross-sectional study employing a questionnaire. Among the 600 members of this group, who made up the study's whole sample, the questionnaires were dispersed at random. Students in higher education who were at least 18 years old made up the study's population. Using a standardized question-

naire taken from the AMD Alliance International Global Report, the interview evaluated respondents' understanding of AMD. Age, gender, education level, and housing type—rural vs. urban—were all recorded as demographic information. Ask them to choose from a list of potential risk factors (age, sex/gender, race, heredity, excessive unprotected sunlight exposure, computer usage, smoking, alcohol, obesity, a lack of vitamins and nutrients, hypertension, diabetes, and hyperlipidemia) those that are most likely to cause AMD.

Statistical Analysis

Our study's statistical analysis was completed using SPSS Version 27 for Windows (IBM Corp., Armonk, NY, USA). 5% was chosen as the degree of significance. For continuous variables, means and standard deviations (SDs) were used to describe the sample's characteristics, while for categorical variables, frequencies and percentages were used. The means of two groups were compared using an independent sample t-test for continuous variables, and an analysis of variance (ANOVA) was performed to analyze the variations in the scores of the variables across several groups.

Results

The sample for our study consisted of 600 students from the Syrian Private University, with 352 males (59%) and 248 females (41%). 429 individuals, or 72% of the total population, lived in the city, while 171 individuals, or 29% of the total, lived in the countryside. Six faculties received students from the sample's student body. The largest group with 161 students, or 27% of the sample, were medical students. With 145 students, or 24% of the total enrollment, the College of Business Administration came in second. The remaining students were split among the faculties of dentistry, petroleum engineering, pharmacy, and informatics engineering, where their numbers totaled 96, 75, 67, and 56 students, respectively. Second-year students made up the highest proportion of students, or 23% of the total. Third-year students, with 120 students, or 20% of the total, came in second. The remaining students were spread out across the first through sixth years. (Table 1).

Table 1: Sociodemographic Characteristics

Gender	N (%)
Male	352 (59)
Female	248 (41)
Residency	
Urban	429 (72)
Rural	171 (29)
Faculty	
Business Administration	145 (24)
Pharmacy	67 (11)
Medicine	161 (27)
Dentistry	96 (16)

Petroleum engineering	75 (13)
Informatics engineering	56 (9)
Academic year	
1	100 (17)
2	137 (23)
3	120 (20)
4	101 (17)
5	97 (16)
6	45 (8)

When questioned about their average daily exposure to the sun-light, 233 students (39%) reported spending between two and four hours in the sun each day, while 191 students reported spending less than two hours in the sun each day, making up 32% of the group. A rate of 29% of the participants (176 students) were exposed to the sun for longer than 4 hours per day. When asked if they see the ophthalmologist on a regular basis to monitor their visual health, 250 students responded in the affirmative (42%), whereas 192 students did not, with a percentage of 32%. Finally, 158 students showed up in total; nevertheless, they did not see the

ophthalmologist frequently; their percentage had reached 26%.

Finally, when asked if any of their family members had macular degeneration or not, 189 students responded positively, making up 32% of the total. The majority of students, however, said that they did not have any family members who had this disease, making up 50% of the total. The remaining students said that they were unsure of whether anyone in their family has this disease or not. (Table 2).

Table 2: Questions About the Students' Personal Habits and Family History

How much average sun exposure do you have per day?	N (%)
<2 hrs.	191 (32)
2-4 hrs.	233 (39)
>4 hrs.	176 (29)
Do you visit the ophthalmologist periodically to check on your visual condition?	
Yes	250 (42)
No	192 (32)
I visit the ophthalmologist but not periodically	158 (26)
Do you have a close family member suffering from macular degeneration?	
Yes	189 (32)
No	299 (50)
I do not know	112 (19)

When the students were asked about the potential symptoms of AMD, the most students responded that the patient's low vision is the most significant symptom, reaching 253 students, or 42%, and 158 students (26%) responded that patients may experience blurry vision. Visual disturbances were ranked third in terms of potential

symptoms, with 99 students responding to this presentation, and their percentage was 13%. Table 3 shows the percentages of participant's answers regarding the most suitable symptoms that may be present in people with age-related macular degeneration.

Table 3: Symptoms of Age -Related Macular Degeneration

Blurry vision	N (%)
Yes	158 (26)
No	442 (74)
Visual distortion	
Yes	99 (17)
No	501 (84)
Low vision	
Yes	253 (42)
No	347 (58)
Low vision for close range	
Yes	88 (15)
No	512 (85)
Blind spot appears in the center of vision.	
Yes	80 (13)
No	520 (87)
Other symptoms	
Yes	80 (13)
No	520 (87)

We obtained the following information by asking several questions on age-related macular degeneration and the level of students' understanding of this condition: 211 students—35% of the total student population—responded that age-related macular degeneration is very common and able-to-detect early, whereas 193 students' responses were the opposite. The percentage of these students was 32%, which is about the same as the number of students who are unaware of this illness, regardless of how widespread it is or if it can be studied. Additionally, 213 students responded that macular degeneration is not a common cause of irreversible low

vision in the world, with a percentage of these students being 36%; 202 students responded in opposition, with a percentage of 34%; and the remaining students took a neutral stance, with a percentage of 30% these students being the remaining students, who did not know about this situation. There were 273 students who responded positively to the argument that this illness is a hereditary illness that should be looked into in the family, with a response percentage of 46%, while 181 students believed that this illness is not genetically transmitted, with a response rate of 30%. (Table 4).

Table 4: Questionnaire About Students' Knowledge of Some Conditions Associated with Agerelated Macular Degeneration

Age-related macular degeneration is a relatively common disease that can be detected early	N (%)
Yes	211 (35)
No	193 (32)
I do not know	196 (33)
Age-related macular degeneration is one of the most common causes of irreversible low vision in the world	
Yes	202 (34)
No	213 (36)
I do not know	185 (30)
Because age-related macular degeneration may be inherited, I'm looking into the possibility of a family affliction.	
Yes	273 (46)
No	181 (30)
I do not know	146 (24)
I see an ophthalmologist on a regular basis to get my vision checked.	

Yes	318 (53)
No	266 (44)
I do not know	16 (3)
Work for an extended period of time on my computer or tablet.	
Yes	372 (62)
No	216 (36)
I do not know	12 (2)
I have a light iris.	
Yes	287 (48)
No	293 (49)
I do not know	20 (3)

31% of students considered aging as a risk factor for the disease, However, 39% and 29% believed that female gender and light-colored iris are risk factors for the disease respectively, whereas 12% said that white race is a risk factor . only 11% of participants believed that unprotected exposure to sunlight is a risk factor of AMD. 16%, 18%, 18% and 13% confirmed that smoking, diabetes, high blood pressure, and obesity are risk factors (table 5).

Table 5: awareness of risk factors of age-related macular degeneration AMD

Risk factor	N (%)
Gender (female)	
Yes	39 (7)
No	561 (94)
Smoking	
Yes	96 (16)
No	504 (84)
aging	
Yes	187 (31)
No	413 (69)
Unprotected exposure to sunlight	
Yes	67 (11)
No	533 (89)
Light-colored iris	
Yes	172 (29)
No	428 (71)
White race	
Yes	69 (12)
No	531 (89)
obesity	
Yes	78 (13)
No	522 (87)
Diabetes mellitus	
Yes	106 (18)
No	464 (82)
High blood pressure	

Yes	106 (18)
No	464 (82)

When asked about treatment options for AMD, the majority of participants showed low level of knowledge. intraocular injection, medical treatment, laser treatment, surgery, dietary supplements, and low vision aids and spectacles, were selected by 14%, 26%, 34%, 14%, 27% and 17% of participants respectively (table 6).

Table 6: awareness of treatment options of age-related macular degeneration AMD

	N (%)
Dietary supplements	
yes	163 (27)
no	437 (73)
Low vision aids and spectacles	
yes	100 (17)
no	500 (83)
Laser therapy	
yes	201 (34)
no	399 (67)
Medical therapy	
yes	155 (26)
no	455 (76)
Intraocular injections	
yes	81 (14)
no	519 (87)
surgery	
yes	82 (14)
no	518 (86)
other	
yes	40 (7)
no	560 (93)

Finally, with a knowledge questionnaire about some macular degeneration information in students, 397 students answered that smoking may induce age-related macular degeneration by 66%, while 355 students answered that exposure to sunlight may induce this disease by 59%, and 399 students answered that eating vegetables and fish contributes to protecting against age-related mac-

ular degeneration, as the answer to this question was 67%, while 378 students had a low awareness level about that. 55% and 24% of students were aware about exudative age-related macular degeneration, and dry age-related macular degeneration respectively (Table 7).

Table 7: Percentages of Knowledge of Some Cases Related to Age-Related Macular Degeneration

Did you know that smoking can trigger age-related macular degeneration	N (%)
Yes	397 (66)
No	203 (34)
Did you know that exposure to sunlight can trigger agerelated macular degeneration	
Yes	355 (59)
No	245 (41)
Did you know that eating vegetables and fish contributes to protecting against age-related macular degeneration	

Yes	399 (67)
No	201 (34)
Did you know that some vitamins have a role in slowing the progression of age-related macular degeneration	
Yes	378 (63)
No	222 (37)
What are the types of AMD	
Exudative AMD	328 (24)
Dry AMD	143 (24)
Both (exudative and dry forms)	24 (4)
I don't know	105 (18)

Furthermore, we did not find a relationship between gender and students' knowledge of a number of cases related to age-related macular degeneration, as they converged to the limit of the numbers and percentages of students in all studied cases, where the p

value was 0.473 for the smoking case, 0.374 for the case of exposure to sunlight, and 0.372 for the case of eating vegetables and fish. (Table 8).

Cases	Gender		P value
	Male	Female	
Did you know that smoking can trigger age-related macular degeneration			0.473
Yes	237 (67)	160 (65)	
No	115 (33)	88 (35)	
Did you know that exposure to sunlight can trigger age-related macular degeneration			0.374
Yes	203 (58)	152 (61)	
No	149 (42)	96 (39)	
Did you know that eating vegetables and fish contributes to protecting against age-related macular degeneration			0.372
Yes	229 (65)	170 (69)	
No	123 (35)	78 (31)	
Did you know that some vitamins have a role in slowing the progression of age-related macular degeneration			0.762
Yes	220 (63)	158 (64)	
No	132 (37)	90 (36)	

Discussion

Despite the rising frequency of AMD, public knowledge of the disease remains alarmingly low [6, 7]. In our survey, 4% of students were aware of AMD, while almost 18% were completely unaware of the problem. This is consistent with the levels of awareness measured in Hong Kong (China) (6%) and Japan (4%) in the AMD Alliance International Global Report 2005, but significantly lower than that of western developed countries such as the United States (30%), Canada (25%), and the United Kingdom (16%) An online national poll in the United States published recently revealed that half of the respondents could be aware of macular degeneration.

Low vision was the most frequently cited symptom of macular

degeneration, with 253 students responding to that question. Next, blurry vision was the most frequently cited symptom of macular degeneration, which is in line with international studies that have found that low or blurry vision are the most common symptoms of macular degeneration [11].

The majority of students (35%) demonstrated that age-related macular degeneration is a common disease that can be detected early. This finding is in line with studies that found age-related macular degeneration to be the primary cause of blindness in people over 50 years old globally, accounting for 8.7% of all cases of legal blindness internationally [12, 13]. As the pupil is dilated during a routine eye exam, the ophthalmologist can more effica-

ciously examine the retina for disease signs, such as the existence of drusen, which is one of the most prevalent early signs of macular degeneration. Studies have shown the significance of early detection of this disease using OCT [14].

And 273 students (46%) said that macular degeneration is a genetic condition, and as a result, they are interested in determining whether family members are affected this is supported by research in which several genes linked to the disease were found [15], This increases the likelihood that someone in the same family may get the illness, and as a result, genetic susceptibility to AMD may increase exposure to other risk factors, including smoking, poor nutrition, and sun exposure [16].

The latest international studies, which showed a positive association between dietary micronutrients and reduced progression in AMD and other eye-related diseases [17, 18], were cited by 378 students who said they were aware that vitamins play a role in slowing the progression of age-related macular degeneration by 63%. Anthocyanins, carotenoids, vitamins A, C, and E, zinc, and selenium are some of these minerals [19].

The majority of students, 399 in total, said that one of the factors that helps prevent age-related macular degeneration is eating fish and vegetables. Higher plasma concentrations of n-3 fatty acids were linked to a lower risk of late AMD in a study of an elderly French population, according to evidence from cross-sectional studies [20], and cohort studies [21]. This research also found an important association between consumption of n-3 fatty acids and a reduced risk of late AMD [22].

Conclusion

Students' knowledge of AMD and associated risk factors was found to be lacking. Furthermore, as raising awareness is the first step in disease prevention and early identification, educational initiatives and extensive public relations campaigns must be developed to increase AMD knowledge among Syrian students. Additionally, early diagnosis and treatment of this condition will spare patients from needless blindness and enhance their quality of life.

Acknowledgments

We are thankful to the management of the Syrian Private University and for their support in the field of medical training and research. We are thankful to everyone who participated in this study.

Funding

This research received no specific grant from SPU or any other funding agency in the public, commercial or non-profit sectors.

Availability of Data and Materials

All data related to this paper's conclusion are available and stored by the authors. All data are available from the corresponding author on a reasonable request.

Declarations

Ethics Approval and Consent To Participate

This study was approved by the Institutional Review Board (IRB) at the Syrian Private University (SPU). All Participants confirmed their written consent by signing the consent form. Participation in the study was voluntary and participants were assured that anyone who was not inclined to participate or decided to withdraw after giving consent would not be victimized. All information collected from this study was kept strictly confidential.

Consent for Publication

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

and were responsible for study design, literature search, and write-up; was responsible for data analysis; participated in literature search and write-up; participated in the study design and reviewed the final draft. All authors read and approved the final draft.

References

1. Steinmetz, J.D. (2021). Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study. *The Lancet Global Health*, 9(2): p. e144e160.
2. Zou, H. D., Zhang, X., Xu, X., Wang, F. H., & Zhang, S. J. (2005). Prevalence study of age-related macular degeneration in Caojiadu blocks, Shanghai. [*Zhonghua yan ke za Zhi*] Chinese Journal of Ophthalmology, 41(1), 15-19.
3. Lim, L. S., Mitchell, P., Seddon, J. M., Holz, F. G., & Wong, T. Y. (2012). Age-related macular degeneration. *The Lancet*, 379(9827), 1728-1738.
4. Chakravarthy, U., Wong, T. Y., Fletcher, A., Piau, E., Evans, C., Zlateva, G., & Mitchell, P. (2010). Clinical risk factors for age-related macular degeneration: a systematic review and meta-analysis. *BMC ophthalmology*, 10, 1-13.
5. Fritsche, L. G., Igl, W., Bailey, J. N. C., Grassmann, F., Sengupta, S., Bragg-Gresham, J. L., & Zhang, K. (2016). A large genome-wide association study of age-related macular degeneration highlights contributions of rare and common variants. *Nature genetics*, 48(2), 134-143.
6. Rosenthal, B., & Thompson, B. (2003). Awareness of age-related macular degeneration in adults: the results of a large-scale international survey. *Optometry (St. Louis, Mo.)*, 74(1), 16-24.
7. Islam, F. M. A., Chakrabarti, R., Islam, S. Z., Finger, R. P., & Critchley, C. (2015). Factors associated with awareness, attitudes and practices regarding common eye diseases in the general population in a Rural District in Bangladesh: the Bangladesh population-based diabetes and eye study (BPDES). *PLoS One*, 10(7), e0133043.

8. Zhang, C. X., Zhang, G. M., Ma, N., Xia, S., Yang, J. Y., & Chen, Y. X. (2017). Awareness of age-related macular degeneration and its risk factors among Beijing residents in China. *Chinese medical journal*, 130(02), 155-159.
9. Lau, J. T. F., Lee, V., Fan, D., Lau, M., & Michon, J. (2002). Knowledge about cataract, glaucoma, and age related macular degeneration in the Hong Kong Chinese population. *British journal of ophthalmology*, 86(10), 1080-1084.
10. Sanjay, S., Neo, H. Y., Sangtam, T., Ku, J. Y., Chau, S. Y., Ros-tihar, A. K., & Au Eong, K. G. (2009). Survey on the knowl-edge of age-related macular degeneration and its risk factors among Singapore residents. *Clinical & experimental ophthal-mology*, 37(8), 795-800.
11. Stahl, A. (2020). The diagnosis and treatment of age-related macular degeneration. *Deutsches Ärzteblatt International*, 117(29-30), 513.
12. Wong, W. L., Su, X., Li, X., Cheung, C. M. G., Klein, R., Cheng, C. Y., & Wong, T. Y. (2014). Global prevalence of age-related macular degeneration and disease burden projec-tion for 2020 and 2040: a systematic review and meta-analy-sis. *The Lancet Global Health*, 2(2), e106-e116.
13. Congdon, N., O'Colmain, B., Klaver, C. C., Klein, R., Munoz, B., Friedman, D. S., & Mitchell, P. (2004). Causes and preva-lence of visual impairment among adults in the United States. *Archives of Ophthalmology* (Chicago, Ill.: 1960), 122(4), 477-485.
14. Padnick-Silver, L., Weinberg, A. B., Lafranco, F. P., & Mac-sai, M. S. (2012). Pilot study for the detection of early exuda-tive age-related macular degeneration with optical coherence tomography. *Retina*, 32(6), 1045-1056.
15. Yoshida, A., Yoshida, M., Yoshida, S., Shiose, S., Hiroishi, G., & Ishibashi, T. (2000). Familial cases with age-related mac-ular degeneration. *Japanese journal of ophthalmology*, 44(3), 290-295.
16. Mousavi, M. and R.A. Armstrong. (2013). Genetic risk fac-tors and age-related macular degeneration (AMD). *J Optom*. 2013 Oct;6(4):176-84.
17. Chew, E. Y. (2013). Nutrition effects on ocular diseases in the aging eye. *Investigative ophthalmology & visual science*, 54(14), ORSF42-ORSF47.
18. Gorusupudi, A., Nelson, K., & Bernstein, P. S. (2017). The age-related eye disease 2 study: micronutrients in the treat-ment of macular degeneration. *Advances in Nutrition*, 8(1), 40-53.
19. Rasmussen, H.M. and E.J. Johnson. (2013). Nutrients for the aging eye. *Clin Interv Aging*. 8: p. 741- 8.
20. Parekh, N., Volland, R. P., Moeller, S. M., Blodi, B. A., Riten-baugh, C., Chappell, R. J., & CAREDS Research Study Group. (2009). Association between dietary fat intake and age-related macular degeneration in the Carotenoids in Age-Related Eye Disease Study (CAREDS): an ancillary study of the Women's Health Initiative. *Archives of ophthalmology*, 127(11), 1483-1493.
21. Chua, B., Flood, V., Rochtchina, E., Wang, J. J., Smith, W., & Mitchell, P. (2006). Dietary fatty acids and the 5-year inci-dence of age-related maculopathy. *Archives of ophthalmolo-gy*, 124(7), 981-986.
22. Merle, B. M., Delyfer, M. N., Korobelnik, J. F., Rougier, M. B., Malet, F., Féart, C., & Delcourt, C. (2013). High concen-trations of plasma n3 fatty acids are associated with decreased risk for late age-related macular degeneration. *The Journal of nutrition*, 143(4), 505-511.

Copyright: ©2023: Taim Shamous. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.