Population awareness of diabetic eye disease and age related macular degeneration in Nepal: the Bhaktapur Retina Study

Raba Thapa¹*, Sanyam Bajimaya¹, Govinda Paudyal¹, Shankar Khanal², Stevie Tan³, Suman S. Thapa¹ and Ger van Rens³

Abstract

Background: Diabetic retinopathy (DR) and age-related macular degeneration (AMD) are among the leading causes of visual impairment and blindness in developing countries. This study aims to explore the awareness of these retinal diseases in Nepal.

Method: A population based cross-sectional study conducted among individuals 60 years and older from the Bhaktapur district of Nepal. One thousand consecutive subjects were enrolled and subjected to a structured questionnaire.

Result: Subject age ranged from 60 to 93 years with a mean of 69.5 years ± 7.1 (S.D.). Males and females comprised 45.1 and 55.9 % of the population, respectively. The majority was illiterate (78.2 %), and agriculture was the predominant occupation (79.8 %). 12.1 % were aware of the effect of diabetes on the eye, and among them, 99 % were aware that diabetes was a blinding disease caused by DR. 11.5 % of the subjects were aware of DR, and 10.1 % were aware that subjects with diabetes should undergo periodic eye examinations. Only 7.6 % of subjects were aware of AMD. 7.5 and 7.4 % were aware about its aggravation with smoking and sunlight exposure, respectively. Younger age group, males, literates, service holders, best corrected visual acuity >0.3 LogMAR, were each significantly associated with an increase in awareness of diabetic retinopathy. Smokers and those with agricultural occupations were less aware regarding AMD. Those with diabetes, with or without DR were significantly more aware than those not having the disease.

Conclusion: Among the Bhaktapur population, awareness of DR and AMD was only 11.5 and 7.6 % respectively. Older age groups, females, illiterates, farmers, and those with poor visual acuity were less aware of these blinding diseases. We recommend community-based eye health education programs targeted at raising awareness of these diseases and preventive measures.

Keywords: Awareness, Age-related macular degeneration, Diabetic retinopathy, Nepal

Background

Diabetic retinopathy (DR) and age related macular degeneration (AMD) are the major causes of visual impairment and blindness worldwide [1–5]. In the developing world, diabetes is now recognized as a major public health conditions due to changes in lifestyle [6]. Diabetic retinopathy is the fifth leading cause of global blindness and the most important cause of blindness among working age individuals. The increased incidence of diabetes has led DR to be an important cause of blindness in the developing world [7]. AMD, the third leading cause of global blindness and the most common cause of irreversible blindness among the elderly in the developed world, is also a leading cause of blindness in the developing countries [8]. A study in Nepal reported that...
AMD was a major cause of blindness with a prevalence of blindness 8.7 % [9]. The prevalence increased with life expectancy, and lack of awareness could be a contributing factor [8, 9].

Blindness from DR and AMD is often preventable since progression is treatable if the disorder is detected early [10]. Raising awareness of modifiable risk factors not only would help reduce the onset of disease and its progression but also would encourage people to seek regular eye examination for early detection [11]. Patients usually present late in the course of the disease, mainly due to lack of awareness [12]. Limited access and availability of retinal services in Nepal also add to the problem because of the limited numbers of eye hospitals and eye care providers [12, 13].

This is the first population-based study to explore awareness of major retinal diseases such as DR and AMD in Nepal.

Methods
The Bhaktapur Retina Study is a population-based, cross-sectional study to estimate the prevalence of vitreo-retinal diseases among subjects 60 years and above residing in the Bhaktapur district of Nepal. This is the second survey on the same cohort that was enrolled for the Bhaktapur Glaucoma Study (BGS) conducted between 2007 and 2010. Details on demographics of the study group have been described elsewhere [14]. In brief, study participants were enrolled from 30 clusters of the district. A sample size of 2100 was calculated after assuming 7 % prevalence for vitreo-retinal disorders in individuals 60 years and older, a relative precision of 25 %, 85 % compliance, and a design effect of 2. The 7 % prevalence of vitreo-retinal disorder was derived from the occurrence of retinal disorders in the BGS [4]. All subjects attended the community eye centre in the Bhaktapur district and underwent an ocular examination. 1000 consecutive subjects of the total of 2100 attending from August 2013 to September 2014 were enrolled in this study.

A structured questionnaire was developed to assess the awareness of diabetic ocular problems and AMD. The questionnaires on diabetic ocular problems focused on the effect of diabetes on eyesight, awareness of diabetic retinopathy, and the need to visit an eye specialist. If aware of DR, the source of awareness was also asked. The questionnaire for AMD focused on awareness of AMD, association with smoking, sunlight exposure and the protective effect of consumption of green leafy vegetables, fish, and antioxidant vitamins.

The questionnaire was developed specifically for this study to assess awareness of these two blinding diseases. A total of four questions focused on diabetic ocular problems, and five questions were directed toward AMD and DR. The questionnaires were pretested before final enrollment in the study and were administered prior to the eye examination. Mid-level ophthalmic personnel were involved in the interview, and 50 cases were pretested. No respondents reported difficulties in answering the questionnaire. .

When the subjects were able to read and write in the national Nepali language, they were categorized as literate as defined by the Government of Nepal. The predominant profession was considered as the occupation. The best corrected visual acuity (BCVA) was assessed using the logarithm of minimum angle of resolution (logMAR) with tumbling E charts placed at 4 m. All patients underwent a detailed history, anterior segment and dilated fundus examination including measurement of intraocular pressure. Two retina specialists performed standardized eye examination on the patients. A total of five fundus photographs were taken of each eye after mydriasis using a Canon digital fundus camera by a trained mid-level ophthalmic technician who had been government certified course to provide primary eye care in ophthalmology.

The blood pressure and random blood sugar were recorded. The diagnosis of diabetes mellitus was based on either the use of diabetic medications or a random blood sugar level of 200 mg/dl or greater. Glycosylated hemoglobin was not measured in this series.

Diabetic retinopathy was graded using Early Treatment Diabetic Retinopathy Study (ETDRS) criteria [10]. Likewise, AMD was categorized according to the international classification developed by the International ARM Epidemiological Study Group [15].

The study was approved by the Institutional Review Board and Ethics Committee of Tilganga Institute of Ophthalmology (TIO) and conducted in accordance with the Declaration of Helsinki. Informed consent was written in the vernacular and was read out for those unable to read. Subjects were asked to sign the consent form, and thumb impressions were taken for those unable to sign prior to enrollment in the study.

Statistical analysis
Descriptive statistical measures such as mean ± S. D. and percentages were used to summarize continuous variables and categorical variables, respectively. The association between awareness and potentially predictive factors were assessed using univariate logistic regression followed by a multiple logistic regression analysis. Those variables which were found significant in a univariate analysis were considered as candidate variables for multiple logistic regressions. We have carried out univariate and multivariate analysis only for awareness of diabetic retinopathy and age-related macular
degeneration. For the rest of the questions on awareness, we have reported descriptive analysis only.

The final set of significant factors associated with awareness was identified through the use of a forward stepwise selection procedure with entry probability of 0.05 and removal probability of 0.10. All statistical analyses were performed using STATA 9.0 (StataCorp LD, College Station, Texas, USA). Results were considered statistically significant at 5 % level of significance.

Results
Demographic information
Information regarding awareness was obtained in 97 % of DR cases and 93 % of AMD cases. Ages ranged from 60 to 93 years, with an average age of 69.5 years ± 7.1 S.D. More than half of the cases belonged to the 60–69 year age group. Females (55.9 %) were significantly higher ($p = 0.012$) as compared to males (45.1 %). Due to higher life expectancy in the females, we had more females in the study. Among the total subjects, 768 (76.8 %) were illiterate. Agriculture was the predominant occupation in 799 subjects (79.8 %) followed by housewives in 81 subjects (8.1 %), service holders in 58 subjects (5.8 %) and others in 62 subjects (6.2 %) (Table 1).

Diabetes mellitus was found in 85 cases (8.5 %). Duration of diabetes ranged from 2 days to 25 years with an average duration of 6.8 years ± 5.5 S.D. Almost two-thirds presented with a history of diabetes duration less than 10 years. Among the total enrolled cases, only 42 % had normal retinal findings, whereas 2 % had non-gradable fundus findings due to hazy media because of cataract. AMD was the most common retinal disease, which was found in 371 subjects (37 %). Diabetic retinopathy comprised of 27 cases (3 %), and hypertensive retinopathy was encountered in 58 cases (6 %). The rest of the 106 cases (11 %) had other retinal problems (Fig. 1).

Awareness of diabetic ocular problems and AMD
Among the enrolled cases, only 10 to 12 % of the population was aware of diabetic consequences for the eyes. Among them, 99 subjects (12.2 %) were aware that diabetes mellitus caused damage to the eyes, 112 subjects (11.5 %) had awareness regarding potential decrease in vision, and 99 subjects (10.2 %) were aware of diabetic retinopathy and the need for diabetics to visit their eye specialists regularly (Table 2).

The source of awareness of DR among these 99 diabetic cases who were aware of DR was from doctors including ophthalmologists in 42 cases (42.4 %), family members in 24 cases (24.2 %), friends in 9 cases (9.1 %), magazines in 6 cases (6.1 %), and other sources in 18 cases (18.2 %). Similarly, only 7 to 10 % were aware of AMD and its associations (Table 2).

Factors associated with awareness of diabetic retinopathy
The association of awareness of DR and AMD was assessed using logistic regression. Univariate logistic regression analysis showed that younger age, male gender, literates, service holders, BCVA $\geq 0.3$ Log MAR, diabetics, longer duration of diabetes, and the presence of diabetic retinopathy each was significantly associated with higher awareness of DR as shown in Table 3. Multiple logistic regressions also showed that the awareness of DR was significantly higher among literates compared to illiterates and between subjects having underlying diabetes mellitus compared to those not having diabetes (Table 5).

Among the 27 cases with DR, only 2 cases had prior intervention with laser therapy or anti vascular endothelial growth factor (VEGF). 18 cases of the 27 cases with DR were unaware of DR. Sight threatening retinopathy with clinically significant macular edema (CSME) and proliferative diabetic retinopathy (PDR) was found in 7 cases of the 27 cases with DR. Among these 7 sight threatening cases, five cases were aware of DR (Table 3).

Factors associated with awareness of age-related macular degeneration
Univariate logistic regression analysis showed that service holders were significantly more aware of AMD relative to those involved in agriculture work. Awareness was less among the elderly people of the 70–79 years age group, female gender, illiterates, smokers and those with BCVA $\geq 0.3$ LogMAR as shown in Table 4.

Awareness of AMD was considerably higher among service holders in comparison to those with agricultural occupations as depicted by the multiple logistic regression analysis (Table 5).

Out of 337 AMD cases, only 20 subjects were aware of AMD (Table 3). None of them had undergone any

### Table 1: Demographic profile of enrolled subjects in the study

| Characteristics          | Number (%) |
|--------------------------|------------|
| Age group (years)        |            |
| 60–69 years              | 518 (51.8) |
| 70–79 years              | 373 (37.3) |
| 80+ years                | 109 (10.9) |
| Gender                   |            |
| Male                     | 451 (45.1) |
| Female                   | 549 (54.9) |
| Literacy                 |            |
| Illiterate               | 768 (76.8) |
| Literate                 | 232 (23.2) |
| Occupation               |            |
| Agriculture              | 790 (79.9) |
| Housewife                | 81 (8.1)   |
| Service holders          | 58 (5.8)   |
| Others                   | 62 (6.2)   |
specific treatment for AMD. Likewise, among the total 337 AMD cases, 254 cases were smokers.

Discussion
This is the first population-based study to explore the awareness of DR and AMD in the elderly people of Nepal. Bhaktapur district is situated approximately 15 km away from the capital city, Kathmandu in the mid-mountain region of Nepal. It is divided into two municipalities and 16 village development committees (VDC). Municipalities are taken as urban and VDC’s as rural areas of the district.

Retinal disorders are the third leading cause of blindness in Nepal, right behind cataract and its iatrogenic sequelae [16]. In the recent Bhaktapur Glaucoma Study, the same cohort as our current study, retinal diseases were found to be the most common cause of visual impairment and blindness [17]. A report from the BGS showed that AMD was the most common retinal disorder followed by DR and retinal vein occlusion among the age group 40 years and above [4]. In our current study, AMD was again identified as the most common retinal disease among the age group 60 years and above.

The awareness of DR among diabetics in our population was only 40%. Awareness of DR among diabetic patients in another population-based study conducted in an urban area of Nepal was 50%, which was higher than our study [13]. This difference could have been due to a difference in study age group, which was more than 60 years of age in the present study and above 40 years in the urban study. The elderly age group and those residing in rural areas of the district were less aware of the condition probably due to the limited access to information and low rate of awareness.

Table 2: Awareness of diabetic ocular problems and age-related macular degeneration

|                                | Yes (%) | No (%) | Total |
|--------------------------------|---------|--------|-------|
| **Diabetes mellitus**          |         |        |       |
| Does diabetes mellitus damage eyes? | 118(12.2) | 852(87.8) | 970   |
| Does diabetes mellitus impair eye sight? | 112(11.5) | 858(88.5) | 970   |
| Are you aware of diabetic retinopathy? | 99(10.2)  | 871(89.8) | 970   |
| Should a person with diabetes visit an eye specialist? | 99(10.2)  | 871(89.8) | 970   |
| **Age-related macular degeneration** |         |        |       |
| Are you aware of AMD?           | 71(7.6)  | 858(92.4) | 929   |
| Do you know smoking aggravates AMD? | 70(7.5)  | 859(92.5) | 929   |
| Do you know sunlight exposure aggravates AMD? | 69(7.4)  | 860(92.6) | 929   |
| Do you know green vegetables and fish protect against AMD? | 94(10.1)  | 835(89.9) | 929   |
| Do you know that certain vitamin help slow AMD progression? | 89(9.6)  | 840(90.4) | 929   |
literacy. The overall rate of awareness of DR in our study (11.5 %) was even lower compared to studies conducted in our neighboring country India where the rates of awareness ranged from 19 to 37 % [11, 18, 19]. This could be explained by poorer economic conditions in Nepal when compared to India.

Among the 27 cases with DR, 71 % of the cases that underwent treatment or who suffered from sight threatening conditions were aware of the condition.

Doctors and family members were the predominant source for awareness of DR in our study, similar to studies conducted in India [11, 20]. Studies conducted among diabetics attending a hospital have almost always shown a higher awareness (67–87 %) of DR in Nepal and other countries [12, 21–24]. A more comprehensive health care strategy, including timely referral to an opthalmologist by physicians and other eye care providers, could potentially lead to a higher rate of awareness. Older persons, females, illiterates, farmers, and BCVA < 0.3 Log MAR were significantly less aware about DR in our study, indicating that these groups need to be targeted more specifically.

In our series, only 7.6 % of subjects were aware of AMD. The availability of effective treatment in the modern era combined with the possibility of prompt detection of sight threatening maculopathy for wet AMD has

| Table 3 Association of awareness of diabetic retinopathy in the population: Univariate logistic regression |
|-----------------------------------------------|
| Age (Years) | No (%) | Yes (%) | Total | Odds Ratio | P - value | 95 % C. I. |
| 60–69 | 435(86.8) | 66(13.2) | 501 | 1.00 |
| 70–79 | 338(93.1) | 25(6.9) | 363 | 0.48 | 0.003 | 0.3–0.8 |
| ≥80 | 98(92.4) | 8(7.5) | 106 | 0.53 | 0.113 | 0.2–1.1 |
| Sex: | | | | |
| Male | 382(87.4) | 55(12.6) | 437 | 1.00 |
| Female | 489(91.7) | 44(8.3) | 533 | 0.62 | 0.028 | 0.4–0.9 |
| Occupation: | | | | |
| Agriculture | 709(91.3) | 67(8.7) | 776 | 1.00 |
| Service holders | 39(72.2) | 15(27.8) | 54 | 4.07 | <0.001 | 2.1–7.7 |
| Housewives | 71(87.6) | 10(12.3) | 81 | 1.49 | 0.269 | 0.7–3.0 |
| Others | 52(88.1) | 7(11.9) | 59 | 1.42 | 0.402 | 0.6–3.2 |
| Education: | | | | |
| Illiterate | 690(92.2) | 58(7.7) | 748 | 1.00 |
| Literate | 181(81.5) | 41(18.5) | 222 | 2.69 | <0.001 | 1.7–4.1 |
| BCVA(Log MAR) | | | | |
| ≥0.3 | 442(86.8) | 67(13.2) | 509 | 1.00 |
| <0.3 | 429(93.1) | 32(6.9) | 461 | 0.49 | 0.001 | 0.3–0.8 |
| Smoking | | | | |
| No smoking | 256(91.1) | 25(8.9) | 281 | 1.00 |
| Present smoker | 296(88.9) | 37(11.1) | 333 | 1.28 | 0.365 | 0.7–2.2 |
| Past smoker | 319(89.6) | 37(10.4) | 356 | 1.18 | 0.323 | 0.7–2.0 |
| Diagnosis of diabetes | | | | |
| No | 820(92.6) | 65(7.3) | 885 | 1.00 |
| Yes | 51(60.0) | 34(40.0) | 85 | 8.41 | <0.001 | 5.1–13.9 |
| Duration of diabetes (yrs) | | | | |
| 0–4 | 25(75.7) | 8(24.3) | 33 | 1.00 |
| 5–9 | 15(57.7) | 11(42.3) | 26 | 2.29 | 0.144 | 0.8–6.9 |
| ≥10 | 11(42.3) | 15(57.7) | 26 | 4.26 | 0.011 | 1.4–12.9 |
| Diabetic retinopathy | | | | |
| No | 853(90.5) | 90(9.5) | 943 | 1.00 |
| Yes | 18(66.7) | 9(33.3) | 27 | 4.73 | <0.001 | 2.1–10.8 |

CI: Confidence interval, BCVA: Best corrected visual acuity, AMD: Age related macular degeneration
a great potential for reducing the risk of blindness [25]. Remarkably, in a developed country like Australia where awareness of cataract (98 %) and glaucoma (93 %) are high, the awareness of AMD was only slightly higher (20 %) than in our study population [26]. Similarly, a study in Hong Kong revealed awareness of AMD in fewer than 1 % of subjects [27]. Therefore, it appears that the awareness of AMD is universally low and seems independent of the level of awareness of other eye diseases.

Our results show that service holders were remarkably more aware than those involved in agricultural work. Literates had more awareness on AMD than illiterates. Awareness was considerably lower among the elderly people, females, present and past smokers, and subjects with poor BCVA (<0.3LogMAR). Higher awareness of AMD among the literates and prestigious service-holders was also found in other large studies in Australia [26, 28]. In one hospital based series among subjects with AMD, 53 % of participants were aware of the importance of antioxidants, and among the 38 % who were using antioxidant vitamins, only 1 % were taking the correct dosage [29]. Cost was the most important factor for not taking the supplementation. Similarly, more than one third of those with advanced AMD were not taking the correct antioxidants in a study conducted in USA [30]. This reflects that the awareness and knowledge regarding the beneficial use of correct vitamin supplementation still needs improvement in developed countries as well. Likewise, awareness regarding the importance of diet, smoking and sunlight exposure is poor around the world.

In the United Kingdom, only 55 % of subjects with AMD were aware that diet was important for eye health and 63 % felt they were not getting enough information about AMD [31]. A hospital-based study in the USA reported less knowledge regarding smoking as a risk factor [32]. Smoking and sunlight exposure are significant risk factors for AMD in studies conducted in Nepal and elsewhere [33–37]. In our series, small percentages (6 %) of those with AMD were aware of their underlying disease, and none had undergone treatment. The majority of the

| Table 4 Association of awareness of age-related macular degeneration in the population: Univariate logistic regression |
|---------------------------------------------------------------|
| Characters | No (%) | Yes (%) | Total | Odds Ratio | P-value | 95 % C I |
| Age (Years) | | | | | | |
| 60–69 | 434(91.2) | 42(8.8) | 476 | 1.00 | | |
| 70–79 | 324(92.8) | 25(7.2) | 349 | 0.79 | 0.389 | 0.5–1.3 |
| ≥ 80 | 100(96.2) | 4(3.8) | 104 | 0.41 | 0.099 | 0.1–1.2 |
| Sex | | | | | | |
| Male | 378(90.9) | 38(9.1) | 416 | 1.00 | | |
| Female | 480(93.6) | 33(6.4) | 513 | 0.68 | 0.125 | 0.4–1.1 |
| Occupations | | | | | | |
| Agriculture | 681(93.2) | 50(6.8) | 731 | 1.00 | | |
| Service holders | 49(84.5) | 9(15.5) | 58 | 2.49 | 0.020 | 1.1–5.4 |
| Housewives | 75(94.9) | 4(5.1) | 79 | 0.72 | 0.544 | 0.2–2.0 |
| Others | 53(86.9) | 8(13.1) | 61 | 2.04 | 0.078 | 0.9–4.5 |
| Education | | | | | | |
| Illiterate | 654(93.3) | 47(6.7) | 701 | 1.00 | | |
| Literate | 204(89.5) | 24(10.5) | 228 | 1.63 | 0.061 | 0.9–2.7 |
| BCVA(Log MAR) | | | | | | |
| ≥ 0.3 | 470(91.4) | 44(8.6) | 514 | 1.00 | | |
| < 0.3 | 388(93.5) | 27(6.5) | 415 | 0.75 | 0.241 | 0.4–1.2 |
| Smoking | | | | | | |
| No smoking | 234(91.4) | 22(8.6) | 256 | 1.00 | | |
| Present smoker | 312(93.1) | 33(6.9) | 335 | 0.78 | 0.430 | 0.4–1.4 |
| Past smoker | 312(92.3) | 26(7.7) | 338 | 0.88 | 0.690 | 0.5–1.6 |
| AMD cases | | | | | | |
| No | 541(91.4) | 51(8.6) | 592 | 1.00 | | |
| Yes | 317(94.1) | 20(5.9) | 337 | 0.67 | 0.142 | 0.4–1.1 |

CI Confidence interval, BCVA Best corrected visual acuity, AMD Age-related macular degeneration
AMD patients were smokers (75.37%). Since smoking is a risk factor for AMD, awareness regarding cessation of smoking in this population has to be stressed more vigorously.

The low awareness of AMD in smokers and agricultural occupation groups in our series is of serious public health concern. Improving awareness could potentially reduce the prevalence and progression of AMD in our population.

A survey in the USA showed that 73% of subjects with DR and 84% of subjects with AMD were unaware of their diseases [38]. Awareness could motivate people to undergo routine eye check-ups, especially in high-risk groups.

Despite the low prevalence of diabetes in developing countries, the rate of blindness from DR is high compared to developed countries. Early detection and early treatment of DR in developed countries could contribute to this disparity [6, 7, 39].

We recommend specifically targeted eye health education programs in the community for preventing blindness from these retinal diseases. Improving literacy seems essential to raising awareness. Furthermore, raising awareness regarding the modifiable risk factors for AMD and DR in younger age groups will help prevent future blindness.

Conclusion
The overall awareness of vision threatening eye conditions and preventive measures is low in the Bhaktapur district of Nepal. Older persons, females, illiterates, farmers, and subjects with poor visual acuity are particularly unaware of blinding retinal conditions.

These findings highlight the need for comprehensive awareness campaigns. These campaigns are necessary to promote increased awareness in a community by involving people from various walks of life in collaboration with community eye centers and eye hospitals. Improving awareness will help in early detection of diseases and reduction in visual impairment and blindness. We recommend follow-up studies of awareness campaigns in the future.

Competing interests
The authors declare that they have no competing interests.

Author contributions
RT carried out the Bhaktapur Retina Study, participated in co-ordination, study concept, study design, data collection, data analysis, and prepared the manuscript. SK participated in data collection. GP was involved in critical analysis of the manuscript. SB participated in data collection. GP was involved in critical analysis of the manuscript. SK participated in study design and performed statistical analysis and critical review of the manuscript. SHT participated in study design and critical analysis of the manuscript. SST participated in study design, study design, manuscript preparation, and critical analysis. GVR was involved in study concept, study design, critical analysis of the manuscript. All authors read and approved the final manuscript.

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Author details
1Tilganga Institute of Ophthalmology, P O Box: 561, Kathmandu, Nepal.
2Central Department of Statistics, Tribhuvan University, Kirtipur, Nepal. 3Vrije University Medical Center, Amsterdam, The Netherlands.

| Table 5 | Multiple logistic regression analysis for awareness of diabetic retinopathy and age-related macular degeneration |
|---------|--------------------------------------------------------------------------------------------------|
|          | Characters | OR  | P- value | 95% CI   |
| Awareness of Diabetic retinopathy | Age (years) | | | |
| 60–69 | 1.00 | | | |
| 70–79 | 0.56 | 0.025 | 0.3–0.9 |
| ≥ 80  | 0.80 | 0.602 | 0.3–1.7 |
| Education | Illiterate | 1.00 | | |
| Literate | 2.38 | <0.001 | 1.5–3.7 |
| Diagnosis of diabetes | No | 1.00 | | |
| Yes | 7.83 | <0.001 | 4.6–13.1 |
| Awareness of AMD | Occupations | | | |
| Agriculture | 1.00 | | | |
| Service holders | 2.49 | 0.020 | 1.1–5.4 |
| Housewives | 0.72 | 0.544 | 0.2–2.1 |
| Others | 2.04 | 0.078 | 0.9–4.5 |

CI: Confidence interval, AMD: Age related macular degeneration
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