Sociodemographic, Lifestyle, and Medical Risk Factors for Visual Impairment in an Urban Asian Population

The Singapore Malay Eye Study

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eTable 1. Univariate Analysis of Risk Factors for Unilateral and Bilateral Low Vision and Blindness by Presenting Visual Acuity

		Unilateral[a]				Bilateral[b]			
		Low Vision		Blindness		Low Vision		Blindness	
Characteristic	No. of Participants	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]
Age, per 10 years	3280	612	2.05 (1.87-2.26)[d]	56	3.31 (2.45-4.45)[d]	790	2.87 (2.61-3.15)[d]	58	4.48 (3.24-6.21)[d]
Sex									
M	1576	309	1 [Reference]	34	1 [Reference]	316	1 [Reference]	18	1 [Reference]
F	1704	303	1.19 (0.98-1.44)	22	0.88 (0.50-1.53)	474	1.97 (1.63-2.39)[d]	40	3.21 (1.80-5.72)[d]
Place of birth									
Singapore	2472	441	1 [Reference]	39	1 [Reference]	540	1 [Reference]	41	1 [Reference]
Malaysia	716	152	0.91 (0.2-1.16)	15	0.80 (0.43-1.49)	209	0.87 (0.70-1.09)	15	0.73 (.40-1.37)
Indonesia/other	86	18	1.58 (0.82-3.06)	2	1.50 (0.33-6.79)	40	2.41 (1.35-4.30)[d]	2	1.36 (0.30-6.20)
Race									
Malay	2141	408	1 [Reference]	37	1 [Reference]	524	1 [Reference]	39	1 [Reference]
Boyanese	401	73	1.07 (0.79-1.44)	9	1.57 (0.74-3.35)	105	1.25 (0.94-1.66)	4	0.66 (0.23-1.90)
Javanese/other	732	131	0.89 (0.70-1.12)	10	0.78 (0.38-1.60)	158	0.82 (0.65-1.04)	15	1.02 (0.55-1.90)
Education									
No formal education	686	149	1.90 (1.33-2.69)[d]	13	1.92 (0.62,5.89)	313	3.96 (2.78-5.64)[d]	35	3.32 (1.16-9.54)[d]
<Elementary school	301	68	1.43 (0.98-2.10)	10	2.49 (0.83,7.43)	89	2.19 (1.48-3.23)[d]	7	1.51 (0.47-4.89)
Elementary school	1474	279	1.21 (0.94-1.56)	27	1.66 (0.66,4.18)	306	1.73 (1.30-2.31)[d]	10	0.57 (0.20-1.64)
High school/college	809	116	1 [Reference]	6	1 [Reference]	77	1 [Reference]	6	1 [Reference]
Occupation									
Service work	704	113	1 [Reference]	9	1 [Reference]	78	1 [Reference]	3	1 [Reference]
Professional or office work	287	37	0.91 (0.60-1.38)	2	0.75 (0.16-3.58)	19	0.73 (0.43,1.25)	0	
Factory work	361	68	1.57 (1.10-2.23)[d]	4	1.22 (0.37-4.04)	82	2.64 (1.82-3.82)[d]	0	
Homemaking	1099	212	1.47 (1.04-2.08)[d]	14	0.99 (0.33-2.96)	342	2.10 (1.47-2.99)[d]	33	3.94 (1.00-15.47)[d]
Retired/ unemployed/other	822	182	1.25 (0.93-1.69)	27	1.56 (0.68-3.54)	268	2.04 (1.48-2.80)[d]	22	3.31 (0.95-11.57)[d]
Individual monthly income, SGD[e]									
<1000	1830	379	1 [Reference]	38	1 [Reference]	526	1 [Reference]	40	1 [Reference]
1000-<2000	656	95	0.70 (0.53-0.92)[d]	6	0.55 (0.22-1.41)	76	0.59 (0.44-0.80)[d]	1	0.16 (0.02-1.18)[d]
2000-<3000	237	27	0.57 (0.36-0.90)[d]	1	0.31 (0.04-2.42)	17	0.44 (0.26-0.76)[d]	0	
≥3000	111	12	0.56 (0.30-1.06)	0		6	0.33 (0.14-0.78)[d]	1	1.22 (0.15-9.58)
Retired	416	92	1.30 (0.96-1.75)	8	1.05 (0.47-2.31)	154	1.48 (1.13-1.94)[d]	16	1.88 (1.01-3.51)[d]
Housing type									
1- to 2-room apartment	504	113	1.64 (1.16-2.33)[d]	8	1.89 (0.55-6.48)	179	2.25 (1.59-3.19)[d]	13	1.39 (0.55-3.52)
3- to 4-room apartment	2253	416	1.12 (0.85-1.48)	44	2.15 (0.76-6.09)	526	1.37 (1.03-1.82)[d]	37	0.92 (0.41-2.02)
5-room apartment/ private housing	515	83	1 [Reference]	4	1 [Reference]	81	1 [Reference]	8	1 [Reference]

(continued)

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eTable 1. Univariate Analysis of Risk Factors for Unilateral and Bilateral Low Vision and Blindness by Presenting Visual Acuity (continued)

		Unilateral[a]				Bilateral[b]			
		Low Vision		Blindness		Low Vision		Blindness	
Characteristic	No. of Participants	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]
Marital status									
Married	2431	458	1 [Reference]	40	1 [Reference]	497	1 [Reference]	24	1 [Reference]
Never married	140	20	1.09 (0.66-1.82)	1	0.92 (0.12-6.94)	27	1.76 (1.10-2.83)[d]	3	5.68 (1.58-20.46)[d]
Divorced/separated	178	25	0.86 (0.55-1.37)	1	0.50 (0.07-3.76)	40	1.32 (0.88-1.99)	3	2.28 (0.66-7.93)
Widowed	517	109	1.24 (0.92-1.69)	14	1.67 (0.81-3.46)	223	1.61 (1.22-2.11)[d]	28	3.15 (1.62-6.09)[d]
Smoking status									
Never	2012	381	1 [Reference]	31	1 [Reference]	151	1 [Reference]	43	1 [Reference]
Current	662	119	1.03 (0.75-1.40)	13	1.27 (0.57-2.85)	117	1.38 (1.00-1.90)[d]	3	0.54 (0.15-1.98)
Past	595	111	0.85 (0.62-1.16)	11	0.73 (0.32-1.66)	153	1.27 (0.94-1.73)	11	1.11 (0.47-2.59)
Diabetes									
No	2514	444	1 [Reference]	41	1 [Reference]	559	1 [Reference]	41	1 [Reference]
Yes	764	168	1.19 (0.95-1.49)	15	1.03 (0.56-1.90)	230	1.14 (0.92-1.42)	17	1.05 (0.58-1.89)
Systolic BP, median, mm Hg									
120, first quartile	840	139	1 [Reference]	8	1 [Reference]	118	1 [Reference]	10	1 [Reference]
137, second quartile	822	144	0.94 (0.71-1.24)	11	1.08 (0.43-2.74)	171	1.17 (0.88-1.56)	8	0.56 (0.21-1.45)
153, third quartile	807	163	1.01 (0.76-1.33)	19	1.59 (0.67-3.75)	197	1.18 (0.89-1.58)	9	0.50 (0.20-1.27)
177, fourth quartile	806	163	1.17 (0.88-1.57)	18	1.62 (0.67-3.91)	304	1.95 (1.46-2.59)[d]	31	1.66 (0.77-3.58)
Diastolic BP, median, mm Hg									
68, first quartile	857	176	1 [Reference]	16	1 [Reference]	199	1 [Reference]	16	1 [Reference]
75, second quartile	788	135	0.81 (0.62-1.06)	17	1.12 (0.55-2.27)	195	1.08 (0.83-1.40)	13	0.92 (0.43-1.97)
82, third quartile	817	160	0.94 (0.72-1.22)	13	0.82 (0.39-1.76)	187	1.07 (0.82-1.40)	8	0.62 (0.26-1.49)
93, fourth quartile	813	138	0.84 (0.64-1.10)	10	0.66 (0.29-1.49)	209	1.26 (0.97-1.63)	21	1.73 (0.87-3.44)
Body mass index[f]									
18.5-22.9, normal	665	125	1 [Reference]	11	1 [Reference]	188	1 [Reference]	13	1 [Reference]
<18.5, underweight	140	35	1.81 (1.10-2.98)[d]	2	1.20 (0.25-5.69)	44	1.46 (0.89-2.40)	4	1.77 (0.53-5.90)
23-27.4, overweight	1208	217	0.87 (0.66-1.13)	23	1.12 (0.53-2.35)	278	0.74 (0.57-0.95)[d]	21	0.83 (0.40-1.71)
>27.5, obese	1191	224	0.90 (0.68-1.18)	19	1.05 (0.48-2.30)	255	0.62 (0.48-0.81)[d]	18	0.62 (0.30-1.34)
Total cholesterol, mg/dL									
<201, desirable	1189	230	1 [Reference]	16	1 [Reference]	257	1 [Reference]	22	1 [Reference]
≥201-<240, borderline	1145	217	1.01 (0.81-1.27)	19	1.39 (0.70-2.75)	265	1.10 (0.88-1.38)	11	0.53 (0.25-1.12)
≥240, high	883	153	0.93 (0.73-1.19)	20	1.84 (0.93-3.64)	257	1.30 (1.03-1.65)	23	1.25 (0.67-2.32)
HDL cholesterol, mg/dL									
≥62, optimal	680	135	1 [Reference]	9	1 [Reference]	180	1 [Reference]	14	1 [Reference]
≥39-<62, desirable	2143	385	0.87 (0.68-1.11)	37	1.17 (0.55-2.50)	517	0.97 (0.77-1.22)	35	0.93 (0.48-1.79)
<39, low	393	80	1.01 (0.71-1.45)	9	1.50 (0.56-4.07)	81	0.97 (0.68-1.40)	7	1.43 (0.53-3.83)
LDL cholesterol, mg/dL									
<100, optimal	541	109	1 [Reference]	5	1 [Reference]	131	1 [Reference]	11	1 [Reference]
≥100-<131, near optimal	976	179	0.94 (0.70-1.25)	20	2.43 (0.89-6.60)	219	0.96 (0.72-1.28)	12	0.64 (0.27-1.49)
≥131-<158, borderline	868	168	1.05 (0.78-1.41)	17	2.59 (0.93-7.18)	203	1.09 (0.82-1.47)	12	0.82 (0.35-1.92)
≥158, high	829	144	0.87 (0.64-1.18)	13	1.79 (0.62-5.12)	225	1.09 (0.82-1.46)	21	1.16 (0.54-2.50)

Abbreviations: BP, blood pressure; CI, confidence interval; HDL, high-density lipoprotein; LDL, low-density lipoprotein; OR, odds ratio.
SI conversion factor: To convert cholesterol, HDL cholesterol, and LDL cholesterol to millimoles per liter, multiply by 0.0259.
[a] Low vision (logMAR>0.30 to <1.00) or blindness (logMAR≥1.00) in the worse eye with normal vision in the other.
[b] Low vision or blindness in both eyes.
[c] Adjusted for age and sex.
[d] $P<.05$.
[e] US dollar conversions: SGD 1000 equals $700; SGD 2000, $1400; and SGD 3000, $2100.
[f] Calculated as weight in kilograms divided by height in meters squared.

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eTable 2. Multivariate Model for Unilateral and Bilateral Low Vision and Blindness by Presenting Visual Acuity

	Multivariate Odds Ratio (95% Confidence Interval)[a]			
	Unilateral[b]		Bilateral[c]	
Characteristic	Low Vision	Blindness	Low Vision	Blindness
Age, per 10 years	1.73 (1.51-1.99)[d]	2.23 (1.46-3.41)[d]	1.90 (1.65-2.17)[d]	2.25 (1.46-3.48)[d]
Sex				
M	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
F	0.75 (0.52-1.08)	0.59 (0.20-1.73)	1.25 (0.86-1.81)	0.42 (0.14-1.30)
Place of birth				
Singapore	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Malaysia	0.87 (0.68-1.12)	0.69 (0.35-1.36)	0.91 (0.72-1.16)	0.65 (0.33-1.29)
Indonesia/other	1.39 (0.71-2.72)	1.39 (0.30-6.51)	1.89 (1.03-3.46)[d]	1.00 (0.21-4.73)
Education				
No formal education	1.54 (1.05-2.25)[d]	1.45 (0.45-4.70)	2.79 (1.90-4.10)[d]	2.35 (0.76-7.30)
<Elementary school	1.26 (0.84-1.89)	1.68 (0.53-5.32)	1.62 (1.06-2.47)[d]	1.10 (0.31-3.98)
Elementary school	1.04 (0.79-1.38)	1.11 (0.43-2.91)	1.36 (0.99-1.86)	0.48 (0.16-1.45)
High school/college	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Occupation				
Service work	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Professional or office work	1.18 (0.75-1.86)	1.90 (0.37-9.72)	1.07 (0.59-1.93)	
Factory work	1.38 (0.95-2.01)	1.05 (0.30-3.67)	2.41 (1.63-3.57)[d]	
Homemaking	1.30 (0.89-1.89)	0.74 (0.22-2.47)	2.01 (1.36-2.98)[d]	3.66 (0.84-15.98)
Retired/unemployed/other	1.03 (0.74-1.44)	1.34 (0.53-3.38)	1.82 (1.28-2.58)[d]	1.99 (0.52-7.60)
Individual monthly income, SGD[e]				
<1000	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
1000-<2000	0.75 (0.55-1.02)	0.51 (0.18-1.44)	0.84 (0.60-1.16)	0.27 (0.03-2.21)
2000-<3000	0.65 (0.39-1.09)		0.89 (0.49-1.63)	
≥3000	0.63 (0.31-1.26)		0.73 (0.29-1.82)	2.57 (0.28-23.39)
Retired	1.23 (0.89-1.69)	1.08 (0.47-2.50)	1.35 (1.00-1.83)[d]	1.66 (0.84-3.25)
Housing type				
1- to 2-room apartment	1.31 (0.89-1.93)	1.39 (0.39-4.96)	1.65 (1.12-2.44)[d]	0.98 (0.36-2.66)
3- to 4-room apartment	0.97 (0.72-1.30)	1.50 (0.52-4.36)	1.15 (0.84-1.58)	0.75 (0.33-1.74)
5-room apartment/private housing	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Marital status				
Married	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Never married	0.93 (0.54-1.58)	0.75 (0.10-5.86)	1.42 (0.86-2.36)[d]	5.85 (1.52-22.48)[d]
Divorced/separated	0.78 (0.48-1.27)	0.44 (0.06-3.37)	1.17 (0.74-1.83)	2.83 (0.76-10.52)
Widowed	1.15 (0.84-1.59)	1.99 (0.91-4.34)	1.48 (1.10-1.98)[d]	3.14 (1.55-6.37)[d]
Smoking status				
Never	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Current	0.95 (0.69-1.31)	1.06 (0.45-2.49)	1.24 (0.88-1.75)	0.38 (0.10-1.48)
Past	0.79 (0.57-1.09)	0.67 (0.29-1.56)	1.22 (0.88-1.70)	0.87 (0.35-2.16)
Diabetes				
No	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Yes	1.17 (0.92-1.49)	1.02 (0.53-1.96)	1.09 (0.87-1.38)	0.99 (0.53-1.85)
Systolic BP, mm Hg, median				
120, first quartile	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
137, second quartile	0.95 (0.71-1.26)	1.08 (0.40-2.95)	1.32 (0.97-1.79)	0.53 (0.20-1.42)
153, third quartile	1.05 (0.78-1.40)	1.88 (0.75-4.71)	1.37 (1.01-1.87)[d]	0.48 (0.18-1.27)
177, fourth quartile	1.13 (0.83-1.53)	1.38 (0.53-3.62)	1.96 (1.44-2.66)[d]	1.30 (0.58-2.93)
Body mass index[f]				
18.5-22.9, normal	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
<18.5, underweight	1.67 (1.00-2.80)[d]	1.05 (0.22-5.08)	1.25 (0.74-2.11)	1.53 (0.44-5.32)
23-27.4, overweight	0.93 (0.70-1.22)	1.23 (0.57-2.64)	0.78 (0.60-1.03)	1.00 (0.47-2.14)
>27.5, obese	0.89 (0.67-1.18)	0.90 (0.39-2.08)	0.62 (0.47-0.81)[d]	0.61 (0.27-1.36)
Low socioeconomic status[g]				
No	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Yes	1.39 (0.98-1.95)	1.46 (0.62-3.45)	1.61 (1.18-2.22)[d]	1.64 (0.75-3.59)

Abbreviation: BP, blood pressure.

[a] Adjusted for all variables within table except low socioeconomic status.

[b] Low vision (logMAR>0.30 to <1.00) or blindness (logMAR≥1.00) in the worse eye with normal vision in the other.

[c] Low vision or blindness in both eyes.

[d] $P<.05$.

[e] US dollar conversions: SGD 1000 equals $700; SGD 2000, $1400; and SGD 3000, $2100.

[f] Calculated as weight in kilograms divided by height in meters squared.

[g] Low socioeconomic status is defined as elementary or lower education, a monthly income of less than SGD 2000, and a 1- to 2-room apartment. Education, income, and housing were excluded as covariates; all other covariates within the table were adjusted for.

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eTable 3. Univariate Analysis of Risk Factors for Unilateral and Bilateral Low Vision and Blindness by Best-Corrected Visual Acuity

		Unilateral[a]				Bilateral[b]			
		Low Vision		Blindness		Low Vision		Blindness	
Characteristic	No. of Participants	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]
Age, per 10 y	3280	272	3.29 (2.83-3.84)[d]	60	3.06 (2.26-4.14)[d]	261	5.21 (4.29-6.33)[d]	24	9.97 (4.25-23.36)[d]
Sex									
M	1576	119	1 [Reference]	34	1 [Reference]	92	1 [Reference]	10	1 [Reference]
F	1704	153	1.69 (1.29-2.22)[d]	26	0.99 (0.58-1.68)	169	2.63 (1.97-3.52)[d]	14	2.17 (0.94-4.97)
Place of birth									
Singapore	2472	183	1 [Reference]	45	1 [Reference]	169	1 [Reference]	13	1 [Reference]
Malaysia	716	76	0.84 (0.62-1.14)	13	0.58 (0.31-1.09)	74	0.84 (0.61,1.15)	8	1.13 (0.46,2.77)
Indonesia/other	86	13	1.49 (0.76-2.91)	2	0.92 (0.21-3.98)	18	2.05 (1.09-3.84)[d]	3	4.09 (1.08-15.44)[d]
Race									
Malay	2141	188	1 [Reference]	40	1 [Reference]	166	1 [Reference]	18	1 [Reference]
Boyanese	401	29	0.94 (0.61-1.45)	11	1.69 (0.85-3.37)	32	1.20 (0.78-1.87)	2	0.72 (0.16-3.18)
Javanese/other	732	55	0.89 (0.64-1.24)	9	0.71 (0.34-1.47)	62	1.12 (0.79-1.57)	4	0.68 (0.22-2.05)
Education									
No formal education	686	112	2.97 (1.66-5.32)[d]	15	1.58 (0.50-4.96)	156	5.99 (2.74-13.09)[d]	15	3.69 (0.42-32.53)
<Elementary school	301	41	2.59 (1.41-4.75)[d]	12	2.71 (0.89-8.22)	19	1.98 (0.83-4.73)	5	3.14 (0.35-28.36)
Elementary school	1474	100	1.81 (1.07-3.08)[d]	28	1.80 (0.68-4.82)	77	2.56 (1.20-5.44)[d]	3	0.64 (0.07-6.36)
High school/ college	809	18	1 [Reference]	5	1 [Reference]	8	1 [Reference]	1	1 [Reference]
Occupation									
Service work	704	33	1 [Reference]	7	1 [Reference]	12	1 [Reference]	2	1 [Reference]
Professional or office work	287	6	0.63 (0.26-1.55)	1	0.49 (0.06-4.01)	0		0	
Factory work	361	15	0.82 (0.43-1.57)	3	0.82 (0.21-3.24)	9	1.33 (0.54-3.28)	0	
Homemaking	1099	110	1.04 (0.62-1.76)	18	1.22 (0.40-3.71)	133	2.56 (1.26-5.20)[d]	11	1.18 (0.18-7.62)
Retired/ unemployed/other	822	108	1.26 (0.81-1.96)	31	1.94 (0.81-4.68)	107	2.64 (1.39-4.99)[d]	11	1.20 (0.25-5.68)
Individual monthly income, SGD[e]									
<1000	1830	186	1 [Reference]	39	1 [Reference]	188	1 [Reference]	18	1 [Reference]
1000-<2000	656	28	0.98 (0.62-1.54)	6	0.73 (0.29-1.83)	4	0.19 (0.07-0.52)[d]	1	0.67 (0.08-5.39)
2000-<3000	237	4	0.58 (0.20-1.63)	0		1	0.23 (0.03-1.73)	0	
≥3000	111	3	0.95 (0.28-3.17)	0		0		0	
Retired	416	50	1.06 (0.74-1.51)	12	1.26 (0.64-2.46)	65	1.28 (0.91-1.79)	5	0.95 (0.34-2.62)
Housing type									
1- to 2-room apartment	504	55	1.59 (0.93-2.71)	13	2.22 (0.71-6.98)	71	1.55 (0.93-2.59)	8	1.07 (0.31-3.70)
3- to 4-room apartment	2253	193	1.54 (0.97-2.45)	42	1.90 (0.67-5.38)	162	1.06 (0.67-1.68)	12	0.51 (0.16-1.62)
5-room apartment/ private housing	515	23	1 [Reference]	4	1 [Reference]	27	1 [Reference]	4	1 [Reference]
Marital status									
Married	2431	182	1 [Reference]	42	1 [Reference]	135	1 [Reference]	13	1 [Reference]
Never married	140	4	0.84 (0.30-2.37)	4	3.74 (1.24-11.25)[d]	4	1.57 (0.54-4.55)	0	
Divorced/separated	178	8	0.73 (0.34-1.55)	0		8	1.06 (0.48-2.30)	1	1.61 (0.20-12.92)
Widowed	517	78	1.09 (0.78-1.54)	13	0.98 (0.48-1.99)	114	1.68 (1.21-2.35)[d]	10	1.43 (0.55-3.71)
Smoking status									
Never	2012	180	1 [Reference]	33	1 [Reference]	180	1 [Reference]	13	1 [Reference]
Current	662	35	1.02 (0.64-1.64)	13	1.46 (0.65-3.27)	27	1.23 (0.73-2.08)	2	1.63 (0.30-8.80)
Past	595	57	1.11 (0.74-1.78)	13	1.01 (0.46-2.23)	51	1.28 (0.82-1.99)	9	3.50 (1.14-10.70)[d]
Diabetes									
No	2514	172	1 [Reference]	44	1 [Reference]	166	1 [Reference]	16	1 [Reference]
Yes	764	100	1.65 (1.25-2.18)[d]	16	1.06 (0.59-1.91)	94	1.55 (1.15-2.09)[d]	8	1.39 (0.59-3.31)
Hypertension									
No	1033	36	1 [Reference]	13	1 [Reference]	28	1 [Reference]	3	1 [Reference]
Yes	2246	236	1.49 (1.02-2.19)[d]	47	0.85 (0.44-1.64)	233	1.47 (0.95-2.28)	21	1.07 (0.31-3.68)
Systolic BP, median, mm Hg									
120, first quartile	840	36	1 [Reference]	9	1 [Reference]	22	1 [Reference]	5	1 [Reference]
137, second quartile	822	55	1.11 (0.71-1.75)	12	1.00 (0.41-2.42)	43	1.28 (0.73-2.23)	4	0.49 (0.13-1.87)
153, third quartile	807	71	1.17 (0.76-1.82)	19	1.31 (0.58-2.99)	71	1.62 (0.96-2.74)	2	0.18 (0.03-0.94)[d]
177, fourth quartile	806	110	1.62 (1.06-2.47)[d]	20	1.28 (0.56-2.92)	125	2.37 (1.44-3.92)[d]	13	0.94 (0.32-2.74)
Diastolic BP, median, mm Hg									
68, first quartile	857	72	1 [Reference]	18	1 [Reference]	68	1 [Reference]	8	1 [Reference]
75, second quartile	788	60	0.97 (0.66-1.41)	20	1.25 (0.65-2.41)	68	1.19 (0.81-1.76)	3	0.45 (0.12-1.74)
82, third quartile	817	72	1.18 (0.82-1.71)	9	0.54 (0.24-1.23)	59	1.11 (0.75-1.66)	4	0.65 (0.19-2.20)
93, fourth quartile	813	68	1.16 (0.80-1.69)	13	0.81 (0.39-1.69)	66	1.30 (0.88-1.93)	9	1.54 (0.58-4.11)

(continued)

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eTable 3. Univariate Analysis of Risk Factors for Unilateral and Bilateral Low Vision and Blindness by Best-Corrected Visual Acuity (continued)

		Unilateral[a]				Bilateral[b]			
		Low Vision		Blindness		Low Vision		Blindness	
Characteristic	No. of Participants	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]	No. of Participants	OR (95% CI)[c]
Body mass index[f]									
18.5-22.9, normal	665	57	1 [Reference]	12	1 [Reference]	71	1 [Reference]	8	1 [Reference]
<18.5, underweight	140	15	1.21 (0.62-2.34)	3	1.23 (0.33-4.52)	18	1.07 (0.56-2.03)	2	1.00 (0.20-4.96)
23-27.4, overweight	1208	101	1.00 (0.69-1.44)	22	1.05 (0.51-2.17)	79	0.64 (0.44-0.94)[d]	10	0.77 (0.30-2.01)
>27.5, obese	1191	88	0.87 (0.60-1.28)	21	1.14 (0.54-2.39)	82	0.65 (0.44-0.94)[d]	4	0.31 (0.09-1.08)
Total cholesterol, mg/dL									
<201, desirable	1189	99	1 [Reference]	21	1 [Reference]	71	1 [Reference]	10	1 [Reference]
≥201-<240, borderline	1145	79	0.87 (0.63-1.21)	18	0.97 (0.51-1.85)	77	1.19 (0.83-1.71)	4	0.46 (0.14-1.49)
≥240, high	883	88	1.28 (0.92-1.77)	20	1.46 (0.78-2.76)	110	2.18 (1.54-3.09)[d]	9	1.33 (0.52-3.38)
HDL cholesterol, mg/dL									
≥62, optimal	680	54	1 [Reference]	11	1 [Reference]	64	1 [Reference]	8	1 [Reference]
≥39-<62, desirable	2143	175	1.12 (0.79-1.58)	42	1.17 (0.58-2.33)	164	0.94 (0.67-1.32)	12	0.53 (0.21-1.34)
<39, low	393	36	1.47 (0.90-2.40)	6	0.92 (0.32-2.62)	30	1.24 (0.73-2.08)	3	0.90 (0.22-3.71)
LDL cholesterol, mg/dL									
<100, optimal	541	55	1 [Reference]	7	1 [Reference]	43	1 [Reference]	6	1 [Reference]
≥100-<131, near optimal	976	74	0.76 (0.51-1.12)	24	1.98 (0.84-4.67)	55	0.71 (0.45-1.12)	5	0.47 (0.14-1.57)
≥131-<158, borderline	868	65	0.84 (0.56-1.25)	12	1.23 (0.48-3.18)	69	1.18 (0.76-1.84)	3	0.39 (0.10-1.61)
≥158, high	829	72	0.87 (0.59-1.29)	16	1.59 (0.64-3.94)	91	1.38 (0.90-2.10)	9	1.00 (0.35-2.91)

See footnotes in eTable 1.

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eTable 4. Multivariate Models for Unilateral and Bilateral Low Vision and Blindness by Best-Corrected Visual Acuity

Characteristic	Multivariate Odds Ratio (95% Confidence Interval)[a]			
	Unilateral[b]		Bilateral[c]	
	Low Vision	Blindness	Low Vision	Blindness
Age, per 10 years	2.55 (2.07-3.14)[d]	2.41 (1.57-3.72)[d]	2.68 (2.10-3.40)[d]	5.27 (2.05-13.55)[d]
Sex				
M	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
F	1.55 (0.91-2.64)	1.29 (0.44-3.73)	1.07 (0.59-1.95)	1.40 (0.26-7.50)
Place of birth				
Singapore	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Malaysia	0.84 (0.62-1.15)	0.54 (0.27-1.09)	0.86 (0.61-1.20)	1.05 (0.41-2.67)
Indonesia/other	1.25 (0.62-2.53)	0.98 (0.22-4.39)	1.56 (0.80-3.05)	3.32 (0.82-13.45)
Education				
No formal education	2.64 (1.40-4.95)	1.21 (0.36-4.05)	3.90 (1.74-8.75)[d]	2.98 (0.31-28.84)
<Elementary school	2.35 (1.22-4.55)	2.36 (0.74-7.51)	1.31 (0.53-3.23)	2.82 (0.29-27.26)
Elementary school	1.71 (0.97-3.03)	1.28 (0.46-3.58)	1.84 (0.85-4.02)	0.53 (0.05-5.65)
High school/college	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Occupation				
Service work	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Professional or office work	0.95 (0.36-2.46)	0.87 (0.10-7.59)		
Factory work	0.76 (0.38-1.51)	0.66 (0.16-2.69)	1.17 (0.45-3.02)	
Homemaking	1.06 (0.60-1.87)[d]	0.70 (0.21-2.33)	2.52 (1.16-5.46)[d]	1.25 (0.17-9.41)
Retired/unemployed/other	1.22 (0.75-2.00)[d]	1.59 (0.61-4.15)	2.26 (1.12-4.56)[d]	0.80 (0.15-4.30)
Individual monthly income, SGD[e]				
<1000	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
1000-<2000	1.21 (0.72-2.01)	0.95 (0.34-2.64)	0.31 (0.11-0.89)[d]	0.67 (0.06-6.83)
2000-<3000	0.69 (0.20-2.39)		0.65 (0.08-5.02)	
≥3000	1.63 (0.43-6.13)			
Retired	0.98 (0.67-1.43)	1.16 (0.56-2.44)	1.07 (0.74-1.56)	0.80 (0.27-2.34)
Housing type				
1- to 2-room apartment	1.53 (0.86-2.69)	1.84 (0.56-6.09)	1.34 (0.76-2.38)	1.26 (0.32-5.00)
3- to 4-room apartment	1.39 (0.85-2.28)	1.31 (0.45-3.81)	1.02 (0.61-1.71)	0.53 (0.15-1.83)
5-room apartment/private housing	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Marital status				
Married	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Never married	0.85 (0.30-2.44)	2.37 (0.65-8.61)	1.52 (0.50-4.60)	
Divorced/separated	0.76 (0.35-1.67)		0.89 (0.38-2.11)	1.46 (0.16-13.37)
Widowed	1.03 (0.72-1.47)	1.12 (0.51-2.42)	1.68 (1.17-2.40)[d]	1.32 (0.49-3.58)
Smoking status				
Never	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Current	1.11 (0.68-1.82)	1.36 (0.57-3.27)	1.35 (0.77-2.34)	1.27 (0.21-7.49)
Past	1.14 (0.74-1.75)	0.85 (0.36-2.00)	1.29 (0.80-2.07)	3.80 (1.21-11.98)[d]
Diabetes				
No	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Yes	1.56 (1.16-2.10)[d]	0.90 (0.46-1.74)	1.59 (1.15-2.19)[d]	1.42 (0.57-3.57)
Systolic BP, mm Hg, median				
120, first quartile	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
137, second quartile	1.08 (0.67-1.75)	1.19 (0.42-3.38)	1.23 (0.69-2.19)	0.36 (0.09-1.47)
153, third quartile	1.22 (0.77-1.94)	2.05 (0.78-5.38)	1.54 (0.89-2.67)	0.16 (0.03-0.88)[d]
177, fourth quartile	1.50 (0.96-2.34)	1.50 (0.56-4.02)	1.98 (1.17-3.33)[d]	0.71 (0.23-2.19)
Body mass index[f]				
18.5-22.9, normal	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
<18.5, underweight	1.20 (0.61-2.36)	0.70 (0.15-3.30)	1.01 (0.51-1.98)	1.02 (0.18-5.80)
23-27.4, overweight	0.96 (0.66-1.40)	1.10 (0.52-2.33)	0.63 (0.42-0.93)[d]	0.85 (0.31-2.34)
>27.5, obese	0.79 (0.53-1.17)	0.94 (0.42-2.11)	0.60 (0.40-0.90)[d]	0.31 (0.08-1.14)

Abbreviation: BP, blood pressure.
[a] Adjusted for all variables within table.
[b] Low vision (logMAR>0.30 to <1.00) or blindness (logMAR≥1.00) in the worse eye with normal vision in the other.
[c] Low vision or blindness in both eyes.
[d] $P<.05$.
[e] US dollar conversions: SGD 1000 equals $700; SGD 2000, $1400; and SGD 3000, $2100.
[f] Calculated as weight in kilograms divided by height in meters squared.

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