

Supplementary Table 1 – Demographic and Systemic Characteristics of Included Subjects Across Three Ethnicities

Systemic Characteristics	Chinese (n = 1,661)	Malay (n = 1,218)	Indian (n = 1,631)	Overall (4,510)	P value
Age, years	55.3 (7.6)	60.5 (8.9)	60.4 (7.8)	58.6 (8.4)	<0.001
Female gender	854 (51.4)	648 (53.2)	825 (50.6)	2327 (51.6)	0.377
Hypertension	802 (48.3)	819 (67.2)	1019 (62.5)	2640 (58.5)	<0.001
Systolic BP, mmHg	132.2 (17.4)	138.5 (19.1)	134.7 (17.9)	134.8 (18.2)	<0.001
Diastolic BP, mmHg	78.0 (10.0)	77.9 (10.2)	77.5 (9.3)	77.8 (9.8)	0.350
Diabetes mellitus	178 (10.7)	325 (26.7)	577 (35.4)	1080 (24.0)	<0.001
Blood glucose, mmol/L	6.07 (2.11)	6.75 (3.08)	7.03 (3.26)	6.59 (2.86)	<0.001
HbA1c, %	5.92 (0.72)	6.17 (1.27)	6.28 (1.24)	6.11 (1.1)	<0.001
Body mass index, kg/m ²	23.62 (3.55)	27.02 (5.18)	26.52 (4.57)	25.59 (4.66)	<0.001
Total cholesterol, mmol/L	5.56 (1.04)	5.48 (1.24)	5.29 (1.19)	5.44 (1.16)	<0.001
HDL, mmol/L	1.31 (0.39)	1.28 (0.34)	1.24 (0.30)	1.28 (0.35)	<0.001
LDL, mmol/L	3.38 (0.89)	3.46 (1.06)	3.56 (0.95)	3.47 (0.96)	<0.001
Triglyceride, mmol/L	1.84 (1.32)	1.90 (1.23)	1.97 (1.08)	1.90 (1.21)	0.018
Chronic kidney disease	44 (2.7)	155 (12.7)	89 (5.5)	288 (6.4)	<0.001
Current smoking	227 (13.7)	234 (19.2)	213 (13.1)	674 (14.9)	<0.001

BP = blood pressure; HbA1c = serum glycosylated hemoglobin; HDL = high density lipoprotein; LDL = low density lipoprotein.

Data were presented in number (percentage) for categorical variables, namely female gender, hypertension, diabetes mellitus, chronic kidney disease and current smoking, whereas the remaining variables were presented in mean (standard deviation).

P values across the 3 ethnic groups were obtained using ANOVA for continuous variables, and chi-square tests for categorical variables.

Supplementary Table 2 - Ocular Characteristics of Included Eyes Across Three Ethnicities

Ocular Characteristics	Chinese (n = 2,577)	Malay (n = 2,072)	Indian (n = 2,798)	Overall (n = 7,447)	P value
Axial length, mm	23.97 (1.24)	23.57 (0.97)	23.47 (1.04)	23.69 (1.13)	<0.001
Spherical equivalent, D	-0.81 (2.36)	0.16 (1.80)	0.29 (1.81)	-0.17 (2.11)	<0.001
Best-corrected visual acuity, logMAR	0.04 (0.06)	0.12 (0.10)	0.10 (0.10)	0.09 (0.10)	<0.001
Central corneal thickness, μ m	553.2 (32.6)	542.4 (33.8)	541.2 (33.1)	546.2 (33.6)	<0.001
Corneal curvature, mm	7.66 (0.26)	7.65 (0.25)	7.62 (0.26)	7.65 (0.26)	0.101
Intraocular pressure, mmHg	14.2 (2.9)	14.5 (3.0)	15.3 (2.8)	14.7 (2.9)	0.003
Presence of any cataract	391 (15.2)	1006 (48.6)	1467 (52.4)	2969 (37.7)	<0.001
History of cataract surgery	82 (3.2)	136 (6.6)	293 (10.5)	538 (6.8)	<0.001
Signal strength	9.3 (0.9)	9.1 (1.0)	8.9 (1.1)	9.1 (1.0)	<0.001

Data were presented in mean (standard deviation) for continuous variables, and in number (percentage) for categorical variables.

P values across the 3 ethnic groups were obtained with repeated-measures analysis of variance for continuous variables, and logistic regression with generalized estimating equation for categorical variables.

Supplementary Table 3 – Univariate Analyses of Associations between Systemic and Ocular Factors with Overall Average and Central Subfield Macular Thickness

Parameters	Overall average macular thickness			Central subfield macular thickness		
	β	95% CI	P value	β	95% CI	P value
Systemic Factors						
Age, per decade	-4.82	-5.27 to -4.38	<0.001	-2.14	-2.88 to -1.41	<0.001
Female (vs Male)	-3.78	-4.54 to -3.01	<0.001	-13.81	-14.98 to -12.64	<0.001
Malay (vs Chinese)	-3.58	-4.53 to -2.62	<0.001	-3.97	-5.52 to -2.41	<0.001
Indian (vs Chinese)	-7.51	-8.38 to -6.65	<0.001	-5.49	-6.94 to -4.04	<0.001
Hypertension	-3.61	-4.39 to -2.83	<0.001	-1.92	-3.17 to -0.66	0.003
Systolic blood pressure, mmHg	-0.06	-0.08 to -0.04	<0.001	-0.04	-0.08 to -0.01	0.010
Diastolic blood pressure, mmHg	0.11	0.07 to 0.15	<0.001	0.19	0.12 to 0.25	<0.001
Diabetes mellitus	-3.89	-4.79 to -2.99	<0.001	-4.07	-5.52 to -2.63	<0.001
HbA1c, %	-0.86	-1.22 to -0.51	<0.001	-1.50	-2.06 to -0.93	<0.001
Body mass index, kg/m ²	-0.25	-0.33 to -0.16	<0.001	-0.44	-0.57 to -0.31	<0.001
Total cholesterol, mmol/L	1.07	0.73 to 1.41	<0.001	0.27	-0.27 to 0.82	0.322
HDL, mmol/L	-0.40	-1.53 to 0.73	0.485	-5.10	-6.89 to -3.30	<0.001
Triglyceride, mmol/L	0.05	-0.27 to 0.37	0.754	0.89	0.38 to 1.41	0.001
Chronic kidney disease	-7.85	-9.45 to -6.26	<0.001	-2.35	-4.92 to 0.21	0.072
Current smokers	3.94	2.86 to 5.02	<0.001	7.45	5.73 to 9.17	<0.001
Ocular Factors						
Axial length, mm	-1.04	-1.36 to -0.72	<0.001	3.59	3.10 to 4.09	<0.001
Spherical equivalent, D	0.41	0.25 to 0.57	<0.001	-0.86	-1.11 to -0.62	<0.001
Corneal curvature, mm	-2.61	-3.97 to -1.25	<0.001	3.56	1.42 to 5.70	0.001
Intraocular pressure, mmHg	-0.11	-0.21 to -0.00	0.040	-0.15	-0.31 to 0.01	0.064
Presence of any cataract	-3.29	-3.92 to -2.66	<0.001	-2.12	-3.10 to -1.15	<0.001
History of cataract surgery	-2.05	-3.10 to -1.00	<0.001	1.84	0.17 to 3.50	0.031
Signal strength	-0.46	-0.64 to -0.28	<0.001	-1.11	-1.39 to -0.83	<0.001

HbA1c = serum glycosylated hemoglobin; HDL = high density lipoprotein.

β denotes the change in macular thickness (in μm) per unit change in corresponding factors.

Supplementary Table 4 – Univariate Analyses of Associations between Systemic and Ocular Factors with Average Inner & Average Outer Macular Thickness

Parameters

Characteristics	Average Inner Macular thickness			Average Outer Macular thickness		
	β	95% CI	P value	β	95% CI	P value
Systemic Factors						
Age (per decade)	-4.85	-5.41 to -4.29	<0.001	-4.85	-5.31 to -4.39	<0.001
Female (vs Male)	-8.99	-9.92 to -8.07	<0.001	-3.06	-3.86 to -2.27	<0.001
Malay (vs Chinese)	-4.67	-5.79 to -3.55	<0.001	-3.61	-4.60 to -2.62	<0.001
Indian (vs Chinese)	-0.45	-0.62 to -0.28	<0.001	-7.83	-8.72 to -6.94	<0.001
Hypertension	-4.67	-5.79 to -3.55	<0.001	-3.70	-4.50 to -2.89	<0.001
Systolic blood pressure, mmHg	-0.45	-0.62 to -0.28	<0.001	-0.06	-0.08 to -0.04	<0.001
Diastolic blood pressure, mmHg	-1.14	-1.58 to -0.70	<0.001	0.10	0.06 to 0.14	<0.001
Diabetes mellitus	-4.67	-5.79 to -3.55	<0.001	-3.76	-4.70 to -2.83	<0.001
HbA1c, %	-1.14	-1.58 to -0.70	<0.001	-0.76	-1.13 to -0.39	<0.001
Body mass index, kg/m ²	1.06	0.64 to 1.48	<0.001	-0.24	-0.32 to -0.15	<0.001
Total cholesterol, mmol/L	1.06	0.64 to 1.48	<0.001	1.13	0.78 to 1.48	<0.001
HDL, mmol/L	-2.62	-4.01 to -1.22	<0.001	-0.00	-1.17 to 1.16	0.994
Triglyceride, mmol/L	0.33	-0.08 to 0.73	0.112	0.01	-0.33 to 0.34	0.964
Chronic kidney disease	-8.33	-10.32 to -6.35	<0.001	-8.00	-9.65 to -6.35	<0.001
Current smokers	6.49	5.15 to 7.83	<0.001	3.82	2.71 to 4.94	<0.001
Ocular Factors						
Axial length, mm	-1.14	-1.58 to -0.70	<0.001	-1.76	-2.09 to -1.43	<0.001
Spherical equivalent, D	1.06	0.64 to 1.48	<0.001	0.61	0.45 to 0.77	<0.001
Corneal Curvature, mm	-1.14	-1.58 to -0.70	<0.001	-3.60	-5.00 to -2.21	<0.001
Intraocular pressure, mmHg	1.06	0.64 to 1.48	<0.001	-0.11	-0.21 to -0.01	0.031
Presence of any cataract	-4.23	-5.05 to -3.42	<0.001	-3.09	-3.73 to -2.45	<0.001
History of cataract surgery	-1.04	-2.41 to 0.33	0.136	-2.55	-3.61 to -1.49	<0.001
Signal strength	-0.96	-1.19 to -0.72	<0.001	-0.46	-0.64 to -0.28	<0.001

HbA1c = serum glycosylated hemoglobin; HDL = high density lipoprotein.

β denotes the change in macular thickness (in μm) per unit change in corresponding factors.

Supplementary Table 5 - Multivariable Analyses of Associations between Systemic and Ocular Factors with Average Inner & Average Outer Macular Thickness

Parameters

Characteristics	Average inner macular thickness				Average outer macular thickness			
	β	Standardised β	95% CI	P value	β	Standardised β	95% CI	P value
Systemic Factors								
Age (per decade)	-4.30	-0.26	-5.03 to -3.56	<0.001	-4.52	-0.33	-5.12 to -3.91	<0.001
Female (vs Male)	-10.72	-0.64	-11.84 to -9.59	<0.001	-5.34	-0.39	-6.22 to -4.47	<0.001
Malay (vs Chinese)	-2.05	-0.12	-3.34 to -0.76	0.002	-1.99	-0.14	-3.06 to -0.92	<0.001
Indian (vs Chinese)	-5.78	-0.35	-7.01 to -4.54	<0.001	-6.43	-0.46	-7.46 to -5.41	<0.001
Hypertension	0.04	0.00	-0.98 to 1.07	0.934	-0.50	-0.04	-1.35 to 0.36	0.258
Diabetes mellitus	-1.82	-0.11	-3.02 to -0.63	0.003	-0.86	-0.06	-1.85 to 0.14	0.091
Body mass index, kg/m ²	-0.02	-0.01	-0.14 to 0.09	0.719	-0.00	-0.00	-0.10 to 0.09	0.951
Total cholesterol, mmol/L	0.52	0.04	0.10 to 0.95	0.015	0.46	0.04	0.12 to 0.80	0.008
HDL, mmol/L	1.31	0.03	-0.27 to 2.89	0.104	-	-	-	-
Chronic kidney disease	-3.98	-0.24	-6.18 to -1.78	<0.001	-3.23	-0.23	-5.07 to -1.39	0.001
Current smoker	0.53	0.03	-0.88 to 1.95	0.461	0.26	0.02	-0.92 to 1.44	0.669
Ocular Factors								
Axial length, mm	-0.75	-0.05	-1.21 to -0.29	0.001	-3.14	-0.26	-3.51 to -2.77	<0.001
Corneal curvature, mm	-3.63	-0.06	-5.52 to -1.75	<0.001	-1.16	-0.02	-2.67 to 0.35	0.132
Intraocular pressure, mmHg	-0.00	-0.00	-0.14 to 0.13	0.951	-0.01	-0.00	-0.11 to 0.09	0.817
Presence of any cataract	-1.53	-0.09	-2.40 to -0.67	0.001	-0.74	-0.05	-1.41 to -0.07	0.030
History of cataract surgery	-	-	-	-	2.51	0.18	-3.43 to 8.46	0.407
Signal strength	-1.51	-0.09	-1.76 to -1.26	<0.001	-0.95	-0.07	-1.13 to -0.77	<0.001

HDL = high density lipoprotein.

β denotes the change in macular thickness (in μm) per unit change in corresponding factors.

Supplementary Table 6 - Distribution of Inner and Outer Macular Quadrant Thickness in Overall Sample and Respective Ethnic Groups.

	Overall	Chinese	Malays	Indian	P (Chinese vs. Malays)		P (Chinese vs Indians)		P (Malays vs Indians)	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inner macula, μm										
Inner temporal	304.7 (16.5)	308.8 (15.5)	304.6 (16.4)	301.1 (16.7)	0.002	0.003	< 0.001	< 0.001	< 0.001	< 0.001
Inner superior	317.2 (17.4)	322.1 (16.3)	317.2 (17.6)	312.7 (17.1)	0.006	0.004	< 0.001	< 0.001	< 0.001	< 0.001
Inner nasal	319.2 (18.2)	324.3 (17.2)	318.9 (18.0)	314.7 (18.0)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Inner inferior	314.0 (17.0)	318.0 (15.8)	313.6 (17.0)	310.7 (17.4)	0.004	0.002	< 0.001	< 0.001	< 0.001	< 0.001
Outer macula, μm										
Outer temporal	257.9 (13.4)	261.1 (12.8)	258.1 (13.7)	254.7 (13.1)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Outer superior	275.1 (14.7)	279.6 (13.8)	275.9 (15.0)	270.3 (13.8)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Outer nasal	294.1 (16.6)	299.0 (15.6)	294.2 (16.9)	289.5 (16.0)	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Outer inferior	262.9 (14.5)	265.8 (13.7)	263.6 (14.7)	259.8 (14.4)	0.299	0.128	< 0.001	< 0.001	< 0.001	< 0.001

Model 1: Adjusted with age, gender, ethnicity, diabetes mellitus, total cholesterol level, chronic kidney disease, axial length, corneal curvature, presence of cataract, and signal strength.

Model 2: Adjusted for same set of covariates as Model 1, but only evaluated among subjects aged between 50 to 80 years old.