

Correlation between Anthropometry and Lipid Profile in Type 2 Diabetic Patients

Faiqa Nazir, Muhammad Uthman Ahmad, Mubeen Un Nisa and Ume Roman

Supplementary Material

This supplementary file provides: (i) correlation analysis among anthropometric predictors, (ii) regression model summaries and multicollinearity diagnostics (tolerance, VIF, condition index), and (iii) univariate (crude) and multivariable (adjusted) regression results for each lipid outcome.

A. Correlation analysis

Table S1: Pearson correlation analysis between BMI, waist circumference, and waist-to-hip ratio (WHR) (n=240).

Variables compared	Pearson r	p-value
BMI (kg/m ²) vs Waist circumference (cm)	0.794	<0.001
BMI (kg/m ²) vs Waist-to-hip ratio (WHR)	0.208	0.001
Waist circumference (cm) vs Waist-to-hip ratio (WHR)	0.303	<0.001

B. Regression model summaries and diagnostics

Table S2: Model summary for linear regression analyses of lipid outcomes (Model 1: BMI+WC+WHR; Model 2: BMI+WC+WHR+age+gender+diabetes duration).

Outcome	Model	R ²	Adjusted R ²	F-statistic	p-value
Total cholesterol (mg/dL)	Model 1	0.897	0.896	683.789	<0.001
Total cholesterol (mg/dL)	Model 2	0.897	0.895	339.223	<0.001
Triglycerides (mg/dL)	Model 1	0.279	0.270	30.429	<0.001
Triglycerides (mg/dL)	Model 2	0.280	0.261	15.094	<0.001
HDL-C (mg/dL)	Model 1	0.540	0.534	92.411	<0.001
HDL-C (mg/dL)	Model 2	0.542	0.530	45.868	<0.001
LDL-C (mg/dL)	Model 1	0.160	0.149	14.954	<0.001
LDL-C (mg/dL)	Model 2	0.182	0.161	8.630	<0.001
VLDL-C (mg/dL)	Model 1	0.321	0.312	37.205	<0.001
VLDL-C (mg/dL)	Model 2	0.323	0.306	18.525	<0.001

Table S3: Model diagnostics: multicollinearity statistics (tolerance and VIF) for predictors used in Model 1 and Model 2.

Predictor	Model 1 Tolerance	Model 1 VIF	Model 2 Tolerance	Model 2 VIF
BMI (kg/m ²)	0.369	2.713	0.342	2.926
Waist circumference (cm)	0.350	2.857	0.348	2.872
Waist-to-hip ratio (WHR)	0.906	1.104	0.903	1.108
Age (years)	—	—	0.543	1.840
Gender (Male=1, Female=0)	—	—	0.861	1.161
Duration of diabetes (years)	—	—	0.551	1.814

Note: Tolerance = 1/VIF. Multicollinearity was considered concerning if VIF > 5 and/or tolerance < 0.20, and severe if VIF > 10 and/or tolerance < 0.10. Maximum condition index was 3.110 for Model 1 and 3.307 for Model 2.

C. Univariate and multivariable regression results (crude and adjusted)

Crude (univariate) models include each predictor separately. Adjusted models include all listed predictors simultaneously (Model 2).

Table S4: Univariate (crude) and multivariable (adjusted) regression results with Total cholesterol (mg/dL) as the dependent variable (n=240).

Variable	Crude beta (95% CI)	Crude p-value	Adjusted beta (95% CI)	Adjusted p-value
BMI (kg/m ²)	11.736 (11.223, 12.250)	<0.001	11.003 (10.125, 11.881)	<0.001
Waist circumference (cm)	5.139 (4.608, 5.671)	<0.001	0.491 (0.028, 0.955)	.038
Waist-to-hip ratio (WHR)	294.168 (109.432, 478.904)	.002	-11.324 (-75.605, 52.957)	.729
Age (years)	0.375 (-0.486, 1.237)	.392	0.093 (-0.286, 0.472)	.628
Gender (Male=1, Female=0)	-38.667 (-53.189, -24.145)	<0.001	-0.383 (-5.737, 4.971)	.888
Duration of diabetes (years)	0.358 (-1.229, 1.944)	.657	0.121 (-0.571, 0.814)	.730

Table S5: Univariate (crude) and multivariable (adjusted) regression results with Triglycerides (mg/dL) as the dependent variable (n=240).

Variable	Crude beta (95% CI)	Crude p-value	Adjusted beta (95% CI)	Adjusted p-value
BMI (kg/m ²)	6.019 (4.752, 7.287)	<0.001	4.576 (2.402, 6.751)	<0.001
Waist circumference (cm)	2.921 (2.224, 3.617)	<0.001	1.016 (-0.132, 2.165)	.083
Waist-to-hip ratio (WHR)	167.102 (-7.969, 342.174)	.061	-11.758 (-170.986, 147.471)	.884
Age (years)	0.040 (-0.767, 0.847)	.923	-0.240 (-1.179, 0.699)	.615
Gender (Male=1, Female=0)	-18.692 (-32.842, -4.542)	.010	1.053 (-12.209, 14.315)	.876
Duration of diabetes (years)	0.217 (-1.268, 1.701)	.774	0.436 (-1.279, 2.152)	.617

Table S6: Univariate (crude) and multivariable (adjusted) regression results with HDL-C (mg/dL) as the dependent variable (n=240).

Variable	Crude beta (95% CI)	Crude p-value	Adjusted beta (95% CI)	Adjusted p-value
BMI (kg/m ²)	-1.053 (-1.178, -0.927)	<0.001	-0.930 (-1.145, -0.715)	<0.001
Waist circumference (cm)	-0.476 (-0.553, -0.399)	<0.001	-0.075 (-0.189, 0.038)	.193
Waist-to-hip ratio (WHR)	-33.073 (-54.527, -11.619)	.003	-4.597 (-20.348, 11.155)	.566
Age (years)	-0.021 (-0.121, 0.080)	.686	-0.026 (-0.118, 0.067)	.589
Gender (Male=1, Female=0)	3.466 (1.743, 5.189)	<0.001	0.033 (-1.279, 1.345)	.961
Duration of diabetes (years)	0.031 (-0.153, 0.215)	.742	0.071 (-0.098, 0.241)	.408

Table S7: Univariate (crude) and multivariable (adjusted) regression results with LDL-C (mg/dL) as the dependent variable (n=240).

Variable	Crude beta (95% CI)	Crude p-value	Adjusted beta (95% CI)	Adjusted p-value
BMI (kg/m ²)	3.685 (2.252, 5.118)	<0.001	2.048 (-0.310, 4.407)	.088
Waist circumference (cm)	1.902 (1.135, 2.668)	<0.001	0.387 (-0.858, 1.633)	.541
Waist-to-hip ratio (WHR)	431.523 (260.718, 602.328)	<0.001	352.415 (179.699, 525.132)	<0.001
Age (years)	0.249 (-0.572, 1.069)	.551	-0.320 (-1.339, 0.699)	.537
Gender (Male=1, Female=0)	-22.431 (-36.750, -8.111)	.002	-12.717 (-27.103, 1.669)	.083
Duration of diabetes (years)	1.057 (-0.449, 2.562)	.168	1.623 (-0.238, 3.484)	.087

Table S8: Univariate (crude) and multivariable (adjusted) regression results with VLDL-C (mg/dL) as the dependent variable (n=240).

Variable	Crude beta (95% CI)	Crude p-value	Adjusted beta (95% CI)	Adjusted p-value
BMI (kg/m ²)	1.790 (1.440, 2.141)	<0.001	1.232 (0.637, 1.828)	<0.001
Waist circumference (cm)	0.908 (0.718, 1.099)	<0.001	0.433 (0.119, 0.748)	.007
Waist-to-hip ratio (WHR)	38.076 (-11.485, 87.636)	.131	-20.558 (-64.152, 23.036)	.354
Age (years)	0.002 (-0.226, 0.230)	.989	-0.043 (-0.300, 0.214)	.740
Gender (Male=1, Female=0)	-4.596 (-8.605, -0.587)	.025	1.366 (-2.265, 4.997)	.459
Duration of diabetes (years)	-0.009 (-0.429, 0.410)	.965	0.007 (-0.462, 0.477)	.975