Supplementary methods:

The primary exposures were ten obesity-related indices, calculated as follows:

BMI: weight (kg) / height^2 (m)

RFM (male): 64 – (20 × height (m) / WC (m)) + (12 × gender), gender = 1 for women and 0 for men

CVAI (male): −267.93 + 0.68 × age + 0.03 × BMI + 4.00 × WC (cm) + 22.00 × log 10 (TG) (mmol/L) − 16.32 × HDL-C (mmol/L)

CVAI (female): −187.32 + 1.71 × age + 4.23 × BMI + 1.12 × WC (cm) + 39.76 × log 10 (TG) (mmol/L) − 11.66 × HDL-C (mmol/L)

WHtR: WC (cm) / height (cm)

VAI (male): WC (cm) / (39.68 + 1.88 × BMI) × TG (mmol/L) / 1.03 × 1.31 / HDL-C (mmol/L)

VAI (female): WC (cm) / (36.58 + 1.89 × BMI) × TG (mmol/L) / 0.81 × 1.52 / HDL-C (mmol/L)

BRI: $364.2\text{-}365.5 \times (1- [\text{WC (cm)} / 2\pi]^2 / [0.5 \times \text{height (cm)}]^2)^{1/2}$

ABSI: WC (m) / [BMI$^{2/3}$ (kg/m^2) × height$^{1/2}$ (m)]

LAP (male): (WC (cm) − 65) × TG (mmol/L)

LAP (female): (WC (cm) − 58) × TG (mmol/L)

WTI: WC (cm) × TG (mmol/L)

C-index: WC (m) / [0.109 × [weight (kg) / height (m)]$^{-1/2}$]

Supplementary Table 1 Multivariable-adjusted associations of lipid profiles with kidney function markers in the study population.

lipid profiles (mmol/L)	eGFR			Log (ACR+1)		
	β	95% CI	P value	β	95% CI	*P* value
TC	-0.046	(-0.336, 0.243)	0.754	0.011	(-0.019, 0.041)	0.475
TG	0.161	(0.025, 0.297)	0.021	0.021	(0.007, 0.035)	0.004
LDL-C	-0.142	(-0.474, 0.189)	0.400	-0.007	(-0.041, 0.027)	0.671
HDL-C	-1.985	(-3.116, -0.854)	<0.001	-0.046	(-0.162, 0.071)	0.442

Linear regression models were adjusted for sex, age, smoking, drinking, and marital status. ACR was log-transformed as log(ACR + 1). eGFR: estimated glomerular filtration rate; ACR: albumin-to-creatinine ratio; TC: total cholesterol; TG: triglycerides; LDL-C: low-density lipoprotein cholesterol; HDL-C: high-density lipoprotein cholesterol.

Supplementary Table 2 Kidney function markers and lipid profiles across albuminuria categories (A1–A3) in the study population

Variable	A1 (ACR <30 mg/g) (n=3070)	A2 (ACR 30-300 mg/g) (n=395)	A3 (ACR≥300 mg/g) (n=61)	*P* overall	*P* trend
eGFR (mL/min/1.73 m²)	103.78 (97.28, 110.28)	104.43 (93.19, 111.81)	96.25 (76.08, 106.59)	<0.001	0.107
Total cholesterol (mmol/L)	4.77 (4.11, 5.50)	4.93 (4.08, 5.62)	5.11 (4.19, 6.15)	0.151	0.110
Triglycerides (mmol/L)	1.84 (1.29, 2.71)	2.10 (1.52, 3.58)	2.04 (1.58, 3.58)	<0.001	<0.001
LDL-C (mmol/L)	3.07 (2.45, 3.69)	3.02 (2.36, 3.71)	3.10 (2.49, 3.96)	0.708	0.679
HDL-C (mmol/L)	1.06 (0.90, 1.27)	1.04 (0.89, 1.21)	1.02 (0.87, 1.23)	0.063	0.019

Values are presented as median (IQR). P for overall difference indicates differences across A1–A3, and P for trend indicates the linear trend across ordered categories. eGFR: estimated glomerular filtration rate; ACR: albumin-to-creatinine ratio; TC: total cholesterol; TG: triglycerides; LDL-C: low-density lipoprotein cholesterol; HDL-C: high-density lipoprotein cholesterol.

Supplementary Table 3 Sensitivity analysis of relative fat mass with additional adjustment for sex in the regression models

Indices	Model 1			Model 2			Model 3		
	OR	**95% CI**	***P* value**	**OR**	**95% CI**	***P* value**	**OR**	**95% CI**	***P* value**
RFM	1.16	1.06-1.28	<0.001	2.01	1.70–2.38	<0.001	1.90	1.61-2.26	<0.001

Model 1: unadjusted. Model 2: adjusted for sex, age, smoking, drinking, marital status. Model 3: additionally adjusted for hypertension and dyslipidemia; RFM: relative fat mass.

Supplementary Table 4 Multivariable logistic regression analyses of the associations between obesity-related indices and chronic kidney disease risk

Indices	Model 1			Model 2			Model 3		
	OR	95% CI	*P* value	OR	95% CI	*P* value	OR	95% CI	*P* value
BMI	1.55	1.41–1.70	<0.001	1.56	1.42-1.72	<0.001	1.07	1.03-1.11	<0.001
RFM	1.16	1.06–1.28	<0.001	1.21	1.08-1.35	<0.001	1.11	0.99-1.25	0.062
CVAI	1.63	1.48–1.80	<0.001	1.63	1.47-1.82	<0.001	1.26	1.12-1.42	<0.001
WHtR	1.53	1.39–1.68	<0.001	1.51	1.37-1.67	<0.001	1.21	1.08-1.36	<0.001
VAI	1.22	1.12–1.32	<0.001	1.24	1.14-1.34	<0.001	1.04	0.94-1.15	0.400
BRI	1.51	1.37–1.66	<0.001	1.49	1.35-1.64	<0.001	1.19	1.07-1.32	0.001
LAP	1.35	1.25–1.46	<0.001	1.38	1.27-1.49	<0.001	1.09	0.98-1.20	0.101
WTI	1.28	1.18-1.39	<0.001	1.31	1.20-1.42	<0.001	1.05	0.95-1.16	0.317
C-index	1.29	1.16-1.42	<0.001	1.24	1.12-1.38	<0.001	1.07	0.96-1.20	0.225

Model 1: unadjusted. Model 2: adjusted for gender, age, smoke, drink, marriage. Model 3: adjusted for glycated hemoglobin A1c (HbA1c), fasting plasma glucose (FPG), systolic blood pressure (SBP), diastolic blood pressure (DBP), fasting C-peptide (FCP), serum uric acid (SUA), white blood cell count (WBC), high-sensitivity C-reactive protein (hs-CRP), pulse, and hypertension. Variables were selected by Least absolute shrinkage and selection operator (LASSO) method. BMI: body mass index; RFM: relative fat mass; CVAI: Chinese visceral adiposity index; WHtR: waist-to-height ratio; VAI: visceral adiposity index; BRI: body roundness index; LAP: lipid accumulation product; WTI: waist–triglyceride index; C-index: conicity index.