

Association between non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratio and mortality in cancer patients: a cohort study.

Supplementary Information

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Table S1. Missing value counts and proportions of covariates.

Variables	Missing count	Proportion of missing (%)
Age	0	0.00
Gender	0	0.00
Race	0	0.00
Marital status	25	0.56
Education level	5	0.11
Body mass index	115	2.59
Waist circumference	283	6.36
Smoking status	4	0.09
Drinking status	248	5.58
Hypertension	1	0.02
Diabetes	24	0.54
Atherosclerotic cardiovascular disease	0	0.00
Use of lipid-lowering drugs	3	0.07

Table S2. Assessment of multicollinearity for multivariate Cox regression models.

Variables	Df	All-cause mortality		Cardiovascular mortality		Cancer-related mortality	
		GVIF	GVIF ^{1/2Df}	GVIF	GVIF ^{1/2Df}	GVIF	GVIF ^{1/2Df}
NHHR	3	1.198	1.031	1.218	1.033	1.185	1.029
Age	1	1.327	1.152	1.265	1.125	1.396	1.182
Gender	1	1.398	1.183	1.432	1.197	1.342	1.158
Race	3	1.251	1.038	1.185	1.029	1.265	1.040
Marital status	1	1.179	1.086	1.192	1.092	1.147	1.071
Education level	2	1.183	1.043	1.160	1.038	1.186	1.044
BMI	2	2.340	1.237	2.204	1.218	2.376	1.242
WC	1	2.136	1.461	1.962	1.401	2.191	1.480
Smoking status	2	1.441	1.096	1.352	1.078	1.455	1.098
Drinking status	2	1.246	1.057	1.248	1.057	1.216	1.050
Hypertension	1	1.125	1.061	1.102	1.050	1.142	1.068
Diabetes	1	1.159	1.077	1.139	1.067	1.159	1.076
ASCVD	1	1.120	1.058	1.127	1.062	1.117	1.057
Use of lipid-lowering drugs	1	1.183	1.088	1.221	1.105	1.175	1.084

Multicollinearity for multivariate Cox regression models was assessed using the Generalized Variance Inflation Factor (GVIF) and its adjusted form (GVIF^{1/2Df}).

Abbreviations: Df, degrees of freedom; NHHR, non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratio; BMI, body mass index; WC, waist circumference; ASCVD, atherosclerotic cardiovascular disease.

Table S3. Association between NHHR and mortality (Quartile 3 as reference group) .

NHHR Quartile	Model 1		Model 2		Model 3	
	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
All-cause mortality						
Quartile 1	1.29 (1.04, 1.60)	0.02	1.44 (1.15, 1.80)	< 0.01	1.47 (1.17, 1.84)	< 0.01
Quartile 2	1.20 (0.99, 1.46)	0.06	1.26 (1.02, 1.56)	0.03	1.25 (1.00, 1.55)	0.05
Quartile 3	Reference		Reference		Reference	
Quartile 4	1.25 (1.01, 1.54)	0.04	1.28 (1.04, 1.59)	0.02	1.25 (1.01, 1.56)	0.04
Cardiovascular mortality						
Quartile 1	1.44 (1.02, 2.04)	0.04	1.61 (1.14, 2.27)	0.01	1.54 (1.07, 2.20)	0.02
Quartile 2	1.26 (0.91, 1.75)	0.16	1.31 (0.93, 1.84)	0.13	1.22 (0.86, 1.75)	0.27
Quartile 3	Reference		Reference		Reference	
Quartile 4	1.59 (1.15, 2.20)	0.01	1.62 (1.15, 2.27)	0.01	1.55 (1.09, 2.22)	0.01
Cancer-related mortality						
Quartile 1	1.28 (0.81, 2.03)	0.29	1.44 (0.90, 2.31)	0.13	1.51 (0.94, 2.41)	0.09
Quartile 2	1.47 (0.97, 2.22)	0.07	1.51 (0.98, 2.33)	0.06	1.53 (0.99, 2.36)	0.05
Quartile 3	Reference		Reference		Reference	
Quartile 4	1.26 (0.80, 1.98)	0.32	1.30 (0.81, 2.08)	0.27	1.24 (0.77, 1.99)	0.37

Model 1: Multivariate model 1 was adjusted for age, gender, race.

Model 2: Multivariate model 2 was adjusted for age, gender, race, marital status, education level, body mass index, waist circumference, smoking status, and drinking status.

Model 3: Multivariate model 3 was adjusted for age, gender, race, marital status, education level, body mass index, waist circumference, smoking status, drinking status, hypertension, diabetes, atherosclerotic cardiovascular disease, and use of lipid-lowering drugs.

Abbreviations: NHHR, non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratio; HR, hazard ratio; CI, confidence interval.

Table S4. Association between NHHR and mortality.

NHHR Quartile	Model 1		Model 2		Model 3	
	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
All-cause mortality						
Quintile 1	Reference		Reference		Reference	
Quintile 2	0.86 (0.71, 1.05)	0.14	0.82 (0.67, 1.00)	0.05	0.80 (0.65, 0.98)	0.03
Quintile 3	0.93 (0.75, 1.15)	0.50	0.86 (0.69, 1.07)	0.18	0.84 (0.67, 1.04)	0.11
Quintile 4	0.75 (0.60, 0.92)	0.01	0.69 (0.55, 0.87)	< 0.01	0.66 (0.53, 0.83)	< 0.01
Quintile 5	0.97 (0.79, 1.20)	0.80	0.88 (0.70, 1.10)	0.26	0.84 (0.67, 1.06)	0.13
P for trend		0.39		0.10		0.04
Cardiovascular mortality						
Quintile 1	Reference		Reference		Reference	
Quintile 2	0.77 (0.51, 1.16)	0.21	0.73 (0.48, 1.10)	0.14	0.71 (0.47, 1.08)	0.11
Quintile 3	0.82 (0.55, 1.21)	0.31	0.75 (0.51, 1.10)	0.15	0.74 (0.50, 1.09)	0.12
Quintile 4	0.72 (0.50, 1.03)	0.07	0.66 (0.46, 0.95)	0.03	0.66 (0.46, 0.95)	0.03
Quintile 5	1.14 (0.75, 1.72)	0.54	1.04 (0.69, 1.56)	0.86	1.04 (0.66, 1.63)	0.87
P for trend		0.68		0.98		0.99
Cancer-related mortality						
Quintile 1	Reference		Reference		Reference	
Quintile 2	1.15 (0.75, 1.78)	0.52	1.11 (0.72, 1.70)	0.65	1.07 (0.69, 1.66)	0.75
Quintile 3	1.18 (0.76, 1.84)	0.46	1.12 (0.72, 1.75)	0.62	1.07 (0.69, 1.66)	0.77
Quintile 4	0.81 (0.48, 1.35)	0.41	0.76 (0.45, 1.29)	0.31	0.71 (0.43, 1.19)	0.19
Quintile 5	1.06 (0.66, 1.69)	0.82	0.97 (0.60, 1.57)	0.92	0.88 (0.54, 1.42)	0.60
P for trend		0.59		0.37		0.16

Model 1: Multivariate model 1 was adjusted for age, gender, race.

Model 2: Multivariate model 2 was adjusted for age, gender, race, marital status, education level, body mass index, waist circumference, smoking status, and drinking status.

Model 3: Multivariate model 3 was adjusted for age, gender, race, marital status, education level, body mass index, waist circumference, smoking status, drinking status, hypertension, diabetes, atherosclerotic cardiovascular disease, and use of lipid-lowering drugs.

Abbreviations: NHHR, non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratio; HR, hazard ratio; CI, confidence interval.

Table S5. Frequency and proportion of cancer categories

Cancer categories	Frequency	Weighted proportion (%)
Skin	874	30.98
Prostate	532	9.35
Breast	515	14.16
Cervix	248	8.21
Colorectal	223	4.30
Melanoma	217	7.88
Other	915	25.13

Only cancer categories with frequency ≥ 200 are listed; categories with frequency < 200 are collapsed into "Other". Weighted proportions were calculated using survey sampling weights.

Table S6. Association between NHHR and mortality (Including follow-up time of less than 2 years).

NHHR Quartile	Model 1		Model 2		Model 3	
	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
All-cause mortality						
Quartile 1	Reference		Reference		Reference	
Quartile 2	1.00 (0.84, 1.18)	0.98	0.94 (0.79, 1.13)	0.51	0.91 (0.76, 1.10)	0.34
Quartile 3	0.88 (0.72, 1.08)	0.22	0.80 (0.65, 0.99)	0.04	0.78 (0.63, 0.96)	0.02
Quartile 4	0.98 (0.82, 1.17)	0.80	0.91 (0.75, 1.10)	0.31	0.86 (0.71, 1.03)	0.11
P for trend		0.51		0.16		0.05
NHHR (continuous)	1.00 (0.95, 1.05)	0.92	0.98 (0.93, 1.03)	0.41	0.96 (0.91, 1.01)	0.14
Cardiovascular mortality						
Quartile 1	Reference		Reference		Reference	
Quartile 2	0.90 (0.64, 1.28)	0.57	0.83 (0.58, 1.19)	0.32	0.81 (0.56, 1.16)	0.24
Quartile 3	0.76 (0.54, 1.08)	0.13	0.68 (0.47, 0.96)	0.03	0.69 (0.48, 0.99)	<0.05
Quartile 4	1.17 (0.83, 1.65)	0.36	1.08 (0.75, 1.53)	0.69	1.05 (0.72, 1.53)	0.80
P for trend		0.55		0.91		0.93
NHHR (continuous)	1.10 (0.98, 1.22)	0.09	1.08 (0.97, 1.20)	0.18	1.07 (0.95, 1.20)	0.29
Cancer-related mortality						
Quartile 1	Reference		Reference		Reference	
Quartile 2	1.28 (0.95, 1.73)	0.11	1.20 (0.89, 1.62)	0.23	1.16 (0.86, 1.57)	0.33
Quartile 3	0.91 (0.59, 1.40)	0.67	0.85 (0.55, 1.31)	0.46	0.81 (0.52, 1.26)	0.36
Quartile 4	0.98 (0.72, 1.34)	0.91	0.91 (0.66, 1.26)	0.57	0.84 (0.60, 1.16)	0.28
P for trend		0.42		0.22		0.09
NHHR (continuous)	0.96 (0.87, 1.05)	0.33	0.94 (0.85, 1.03)	0.16	0.91 (0.83, 1.00)	0.06

Model 1: Multivariate model 1 was adjusted for age, gender, race.

Model 2: Multivariate model 2 was adjusted for age, gender, race, marital status, education level, body mass index, waist circumference, smoking status, and drinking status.

Model 3: Multivariate model 3 was adjusted for age, gender, race, marital status, education level, body mass index, waist circumference, smoking status, drinking status, hypertension, diabetes, atherosclerotic cardiovascular disease, and use of lipid-lowering drugs.

Abbreviations: NHHR, non-high-density lipoprotein cholesterol to high-density lipoprotein cholesterol ratio; HR, hazard ratio; CI, confidence interval.