# Supplementary Materials

## Relationships of sarcopenia symptoms, dietary patterns, with lung cancer risk: a prospective cohort study

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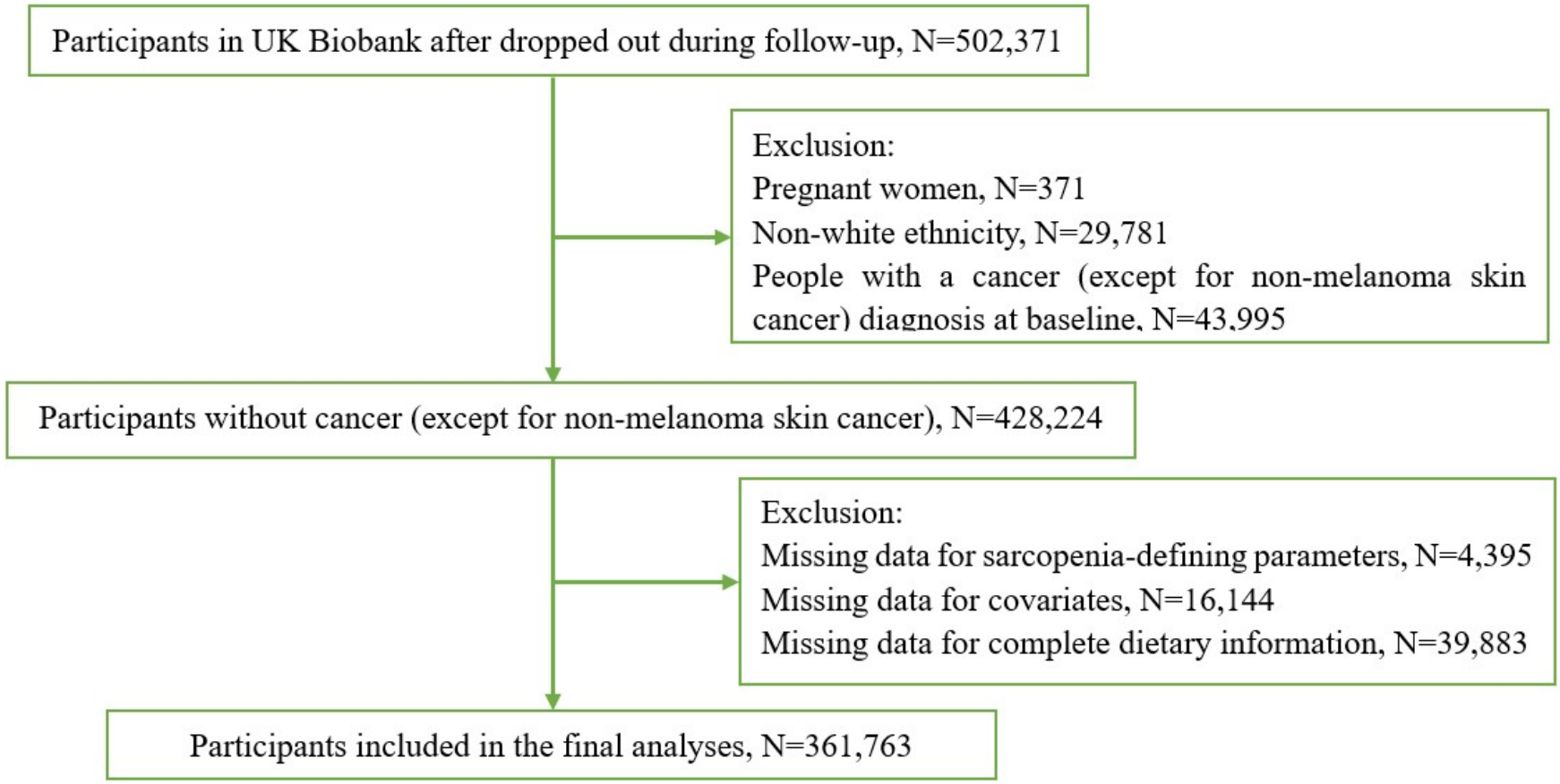


Figure S1. Flow chart

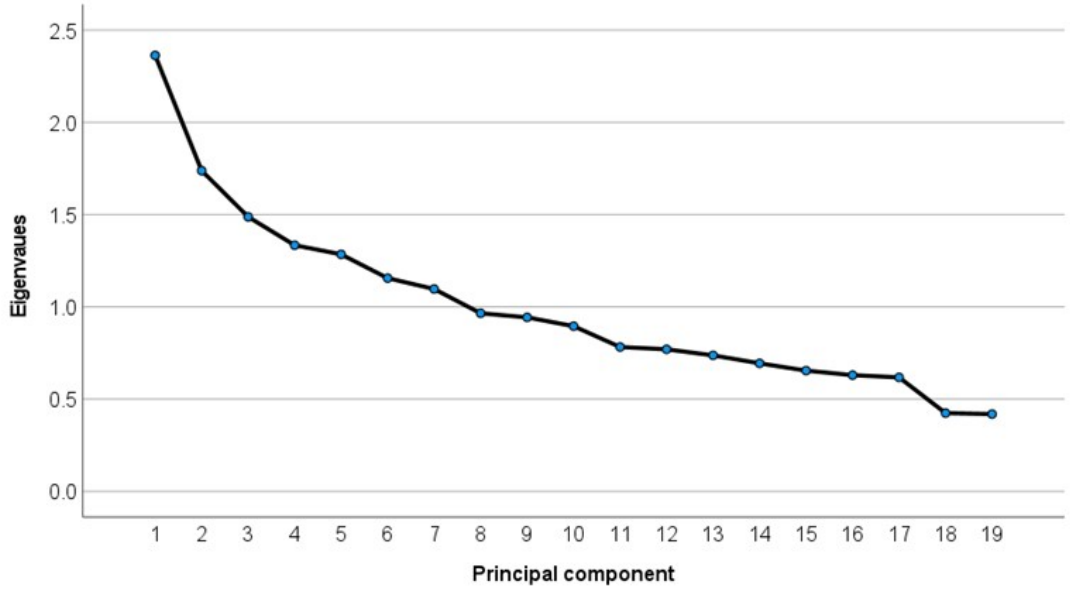


Figure S2. The scree plot for the principal component analysis of different dietary components from the baseline food frequency questionnaire

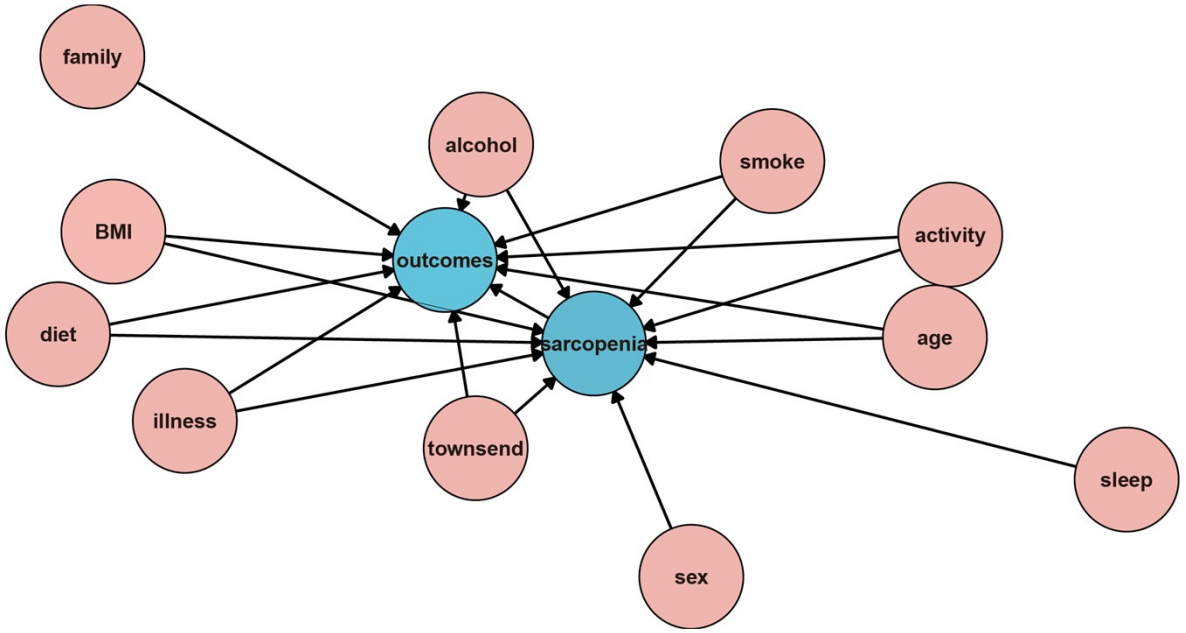


Figure S3. Visualization of variable associations using Directed Acyclic Graph (DAG)

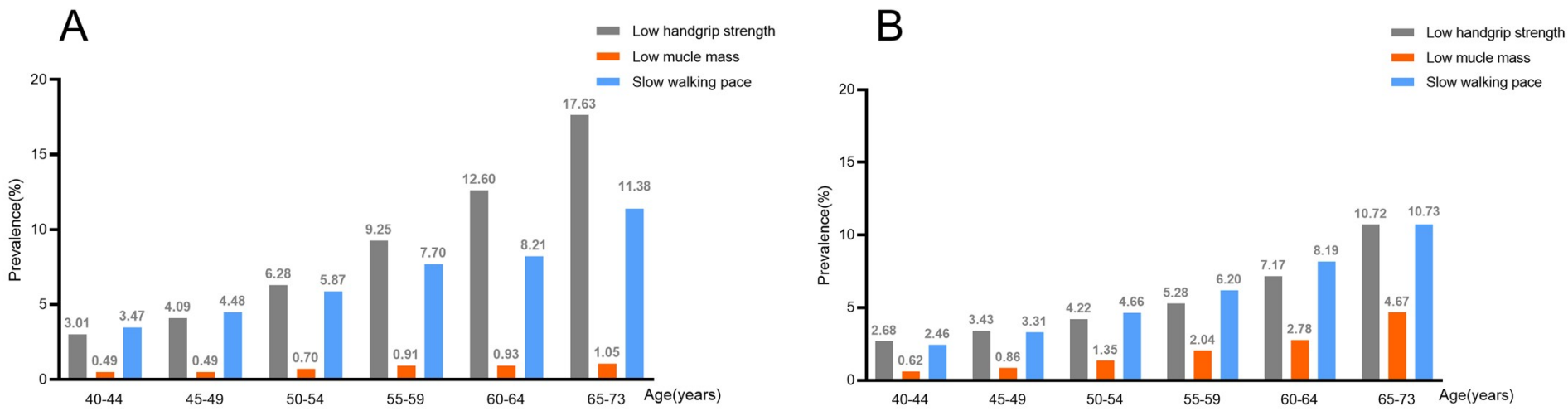


Figure S4. Age-specific prevalence of sarcopenia symptoms in women (A) and men (B)
There were no participants aged 38-39 years with sarcopenia symptoms, so this group was not shown in the figure.

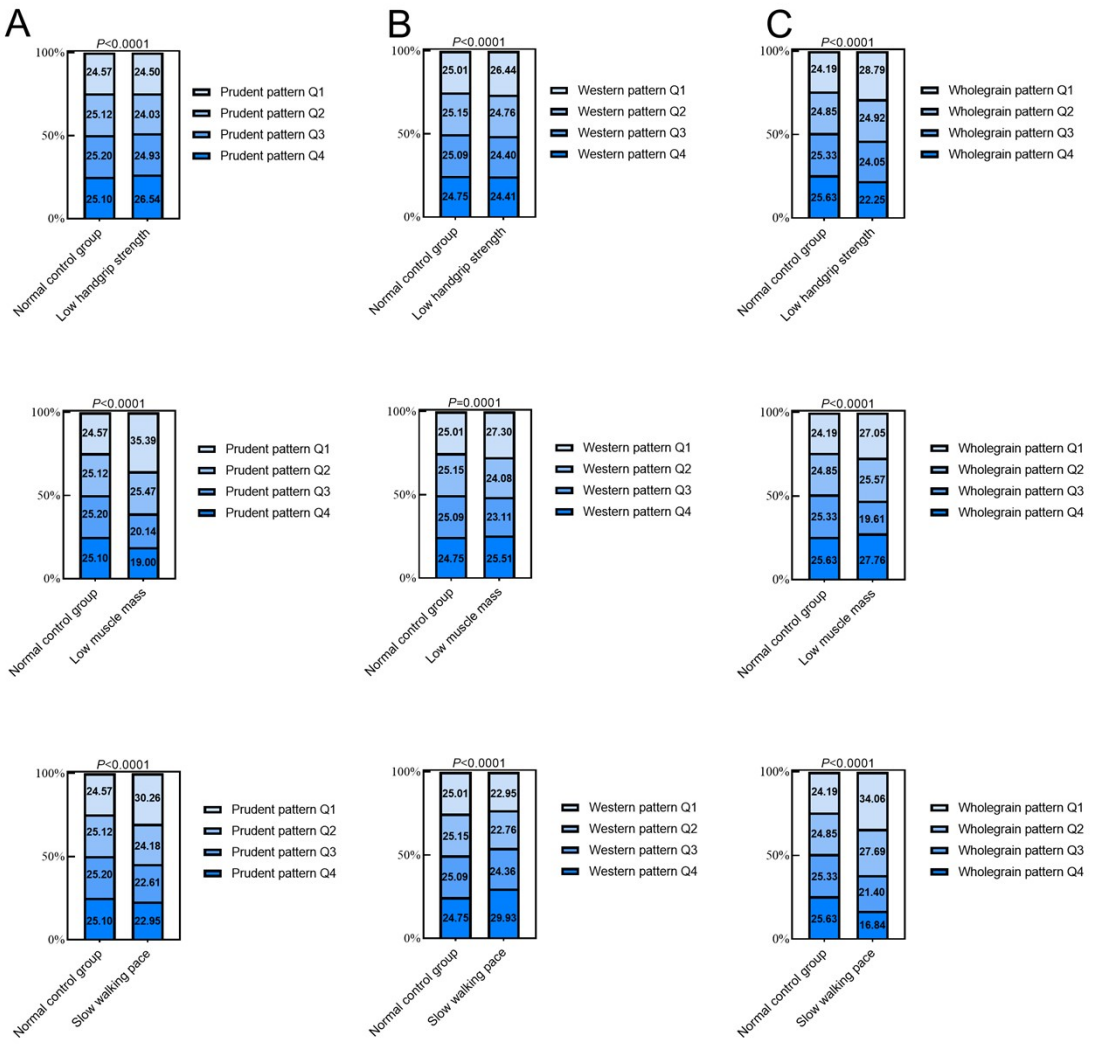


Figure S5. Distribution of quartiles of dietary patterns by sarcopenia symptoms

(A) Distribution of quartiles of Prudent pattern by sarcopenia symptoms

(B) Distribution of quartiles of Western pattern by sarcopenia symptoms

(C) Distribution of quartiles of Wholegrain pattern by sarcopenia symptoms

Chi-square tests were used for testing distribution of quartiles of dietary patterns by sarcopenia symptoms. Abbreviations: Q, quartile.

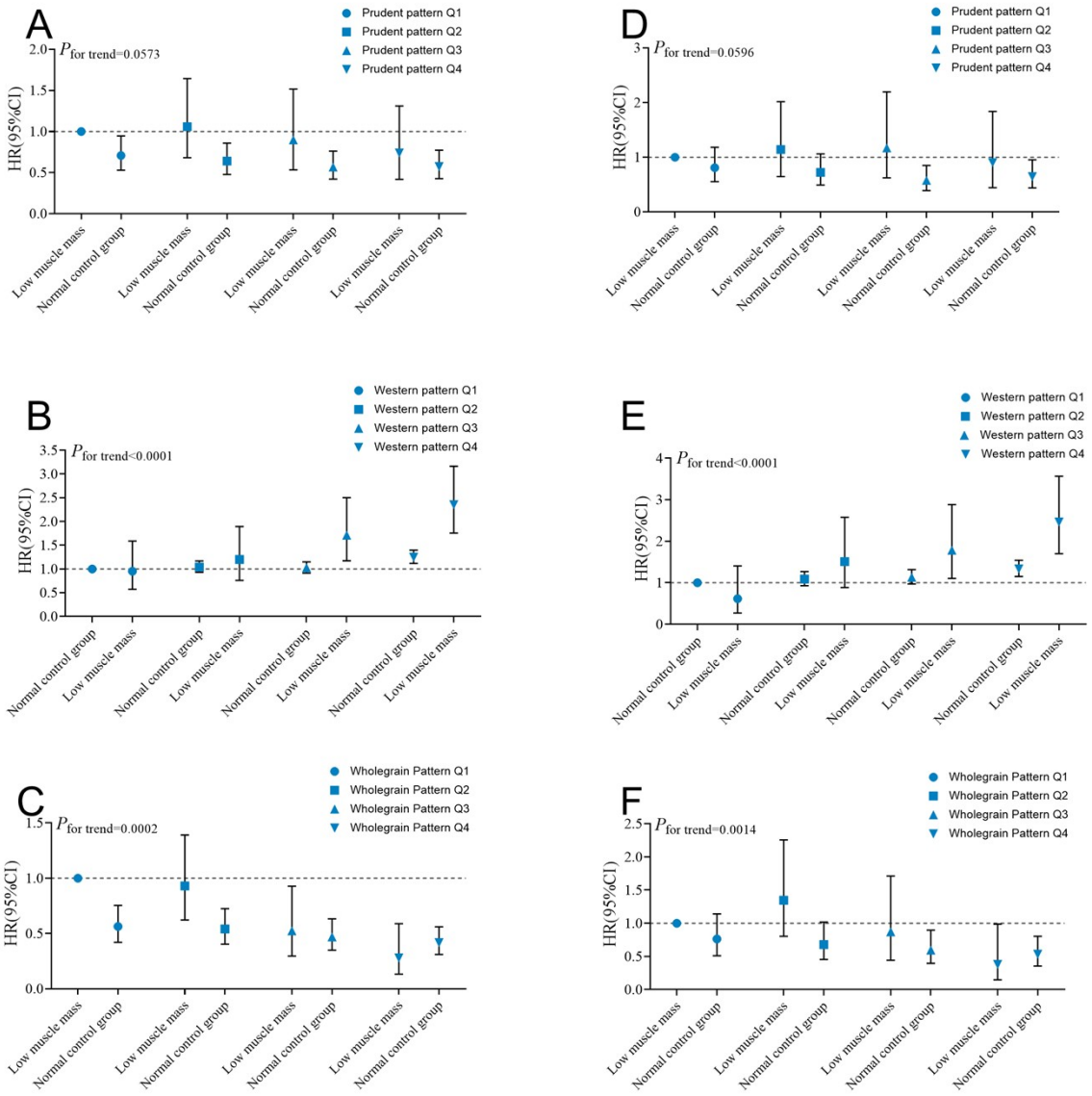


Figure S6. The combined effects of low muscle mass and PCA-derived dietary patterns on lung cancer incidence (A, B, C) and mortality (D, E, F)

The Cox proportional hazards regression models were adjusted for age, sex, Townsend deprivation index, body mass index, alcohol frequency, smoking status, family history of cancer, No. of long-term conditions, physical activity, sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; PCA, principal component analysis; Q, quartile.

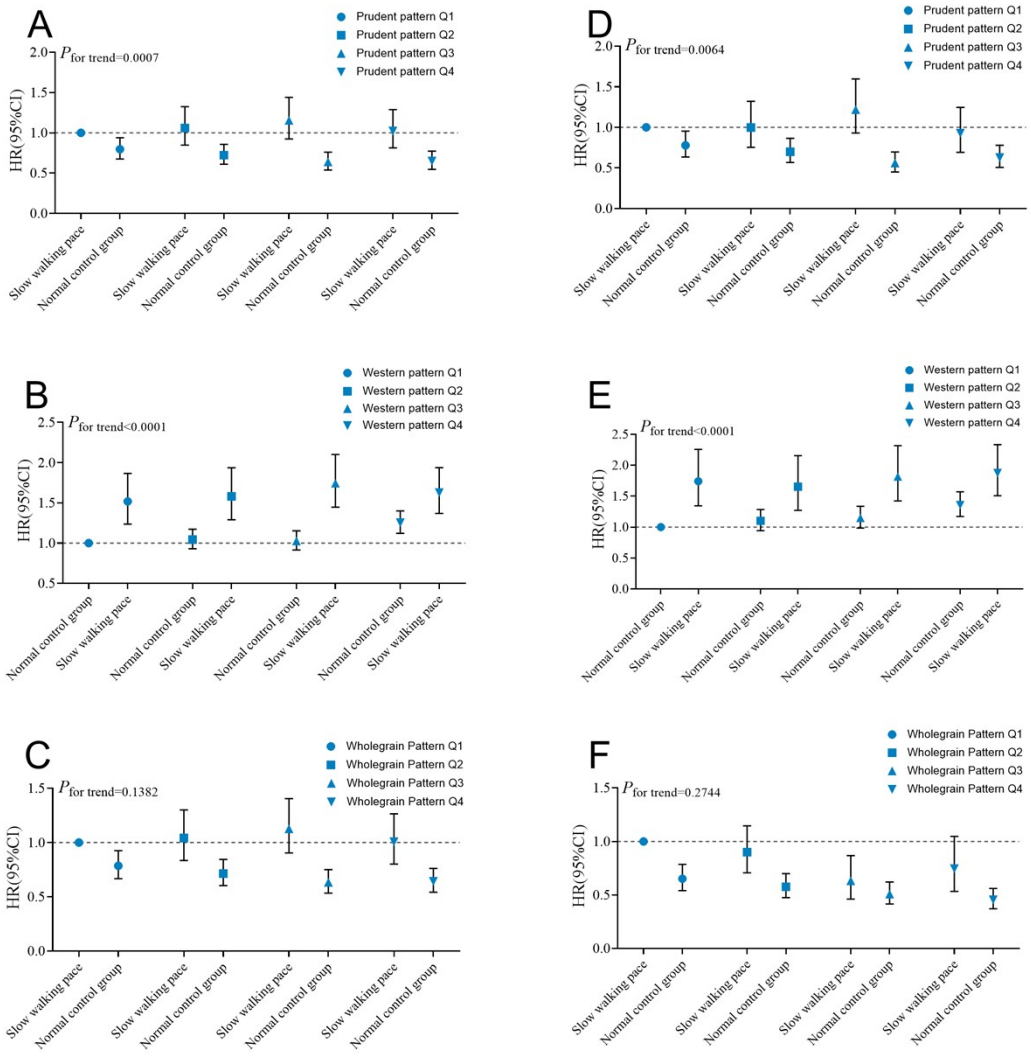


Figure S7. The combined effects of slow walking pace and PCA-derived dietary patterns on lung cancer incidence (A, B, C) and mortality (D, E, F)

The Cox proportional hazards regression models were adjusted for age, sex, Townsend deprivation index, body mass index, alcohol frequency, smoking status, family history of cancer, No. of long-term conditions, physical activity, sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; PCA, principal component analysis; Q, quartile.

Table S1. Adaptation of sarcopenia-defining parameters criteria for the UK Biobank [a]

| Component | Original criteria | UK Biobank | Field IDs |
|---|---|---|---|
| Low muscle strength | Hand grip strength<27kg (men) and <16 kg (women) | Hand grip strength<27kg (men) and<16 kg (women) | 46,47 |
| Low muscle mass | ALST /height$^2$<7.0 kg/m$^2$ (men) or <5.5 kg/m$^2$ (women) | ALST /height$^2$<7.0 kg/m$^2$ (men) or <5.5 kg/m$^2$ (women) | 23114,23118 23122,23126 |
| Low physical performance | Gait≤0.8 meters/s | Self-reported: 'How would you describe your usual walking pace?' Response: slow = 1, other = 0 (average, brisk, none of the above) | 924 |

[a] Assessed using the European Working Group on Sarcopenia in Older People 2 (EWGSOP2) definition.

Abbreviation: ALST, appendicular lean soft tissue.

Table S2. Coding of intake for each touchscreen food

| Components | Field IDs | Coding |
|---|---|---|
| Beef | 1369 | 'Never' = 0, 'Less than once a week' = 0.5, 'Once a week' = 1, '2-4 times a week' = 3, '5-6 times a week' = 5.5, 'Once or more daily' = 7 |
| Pork | 1389 | |
| Lamb/mutton | 1379 | |
| Processed meat | 1349 | |
| Poultry | 1359 | |
| Oily fish | 1329 | |
| Non-oily fish | 1339 | |
| Cheese | 1408 | |
| Fresh fruit | 1309 | 'Less than one piece/day' = 0.5; Amount per serving: fresh fruit – 1piece; dried fruit – 2 pieces |
| Dried fruit | 1319 | |
| Cooked vegetables | 1289 | 'Less than one tablespoon/day' = 0.5; Amount per serving: cooked/raw vegetables – 2 heaped tablespoons |
| Salad/raw vegetables | 1299 | |
| Grain cereal | 1458,1468 (bran cereal or oat cereal or muesli) | 'Less than one bowl/week' = 0.5; Amount per serving: Bran/oat/muesli cereal– 1 bowl/week |
| Other cereal | 1458,1468 (biscuit cereal or other: cornflakes, Frosties) | 'Less than one bowl/week' = 0.5; Amount per serving: Biscuit/other/ do not know/prefer not to answer– 1 bowl/week |
| Wholegrain Bread | 1438,1448 (Wholemeal or wholegrain) | 'Less than one slice/week' = 0.5; Amount per serving: Whole-meal/wholegrain bread – 1 slice/week |
| Other bread | 1438,1448 (white or brown or other type of bread) | 'Less than one slice/week' = 0.5; Amount per serving: White/brown/other/ do not know/prefer not to answer– 1slice/week |
| Tea | 1488 | 'Less than one cup/day' = 0.5 |
| Water | 1528 | 'Less than one glasses/day' = 0.5 |
| Coffee | 1498 | 'Less than one cup/day' = 0.5 |

Table S3. Definition and list of long-term morbidities

| | Morbidity grouping | Conditions included | Code |
|---|---|---|---|
| 1 | Hypertension | Hypertension | 1065 |
| | | Essential hypertension | 1072 |
| 2 | Coronary heart disease | Heart attack/MI | 1075 |
| | | Angina | 1074 |
| 3 | Diabetes | Diabetic nephropathy | 1607 |
| | | Diabetic neuropathy/ulcers | 1468 |
| | | Diabetes | 1220 |
| | | Type 1 diabetes | 1222 |
| | | Type 2 diabetes | 1223 |
| | | Diabetic eye disease | 1276 |
| 4 | Stroke/TIA | Stroke | 1081 |
| | | TIA | 1082 |
| | | Subarachnoid haemorrhage | 1086 |
| | | Brain haemorrhage | 1491 |
| | | Ischaemic stroke | 1583 |
| 5 | Atrial fibrillation | Atrial fibrillation | 1471 |
| 6 | Heart failure | Cardiomyopathy | 1079 |
| | | Hypertrophic cardiomyopathy | 1588 |
| | | Heart failure/pulmonary oedema | 1076 |
| 7 | Peripheral vascular disease | Peripheral vascular disease | 1067 |
| | | Leg claudication/intermittent claudication | 1087 |
| 8 | COPD | COPD/Chronic obstructive pulmonary disease | 1112 |
| | | Emphysema/Chronic bronchitis | 1113 |
| 9 | Asthma | Asthma | 1111 |
| 10 | Bronchiectasis | Bronchiectasis | 1114 |
| 11 | Dyspepsia | Gastro-oesophageal reflux (GORD) | 1138 |
| | | Oesophagitis/Barrett’s oesophagus | 1139 |
| | | Gastric stomach ulcers | 1142 |
| | | Gastric erosions/gastritis | 1143 |
| | | Duodenal ulcer | 1457 |
| | | Dyspepsia/indigestion | 1510 |
| | | Hiatus hernia | 1474 |
| | | Helicobacter pylori | 1442 |
| 12 | Diverticular disease | Diverticular disease/diverticulitis | 1458 |
| 13 | Irritable bowel syndrome | Irritable bowel syndrome | 1154 |
| 14 | Chronic liver disease | Oesophageal varices | 1141 |
| | | Non infective hepatitis | 1157 |
| | | Liver failure/cirrhosis | 1158 |
| | | Primary biliary cirrhosis | 1506 |
| 15 | Inflammatory bowel disease | Inflammatory bowel disease | 1461 |
| | | Crohn’s disease | 1462 |
| | | Ulcerative colitis | 1463 |
| 16 | Constipation | Constipation | 1599 |

| | | | |
|---|---|---|---|
| | Viral hepatitis | Hepatitis B | 1579 |
| | | Hepatitis C | 1580 |
| | | Hepatitis D | 1581 |
| 18 | Depression | Depression | 1286 |
| | | Postnatal depression | 1531 |
| 19 | Anxiety | Anxiety/panic attacks | 1287 |
| | | Nervous breakdown | 1288 |
| | | Post-traumatic stress disorder | 1469 |
| | | Obsessive compulsive disorder | 1615 |
| | | Stress | 1614 |
| | | Insomnia | 1616 |
| | | Psychological/psychiatric problem | 1243 |
| 20 | Schizophrenia/Bipolar affective disorder | Schizophreniav | 1289 |
| | | Mania | 1291 |
| | | Bipolar disorder | 1291 |
| | | Manic depression | 1291 |
| 21 | Connective tissue diseases | Myositis/myopathy | 1322 |
| | | Systemic lupus erythematosus/SLE | 1381 |
| | | Connective tissue disorder | 1373 |
| | | Sjogren’s syndrome.sicca syndrome | 1382 |
| | | Dermatopolymyositis | 1383 |
| | | Scloeroderma/systemic sclerosis | 1384 |
| | | Rheumatoid arthritis | 1464 |
| | | Psoriatic arthropathy | 1477 |
| | | Dermatomyositis | 1480 |
| | | Polymyositis | 1481 |
| | | Polymyalgia rheumatica | 1377 |
| 22 | Painful conditions | Back pain | 1534 |
| | | Joint pain | 1537 |
| | | Headaches (not migraine) | 1436 |
| | | Sciatica | 1476 |
| | | Plantar fasciitis | 1540 |
| | | Carpal tunnel syndrome | 1541 |
| | | Fibromyalgia | 1542 |
| | | Arthritis | 1538 |
| | | Shingles | 1573 |
| | | Disc problem | 1532 |
| | | Prolapsed disc/slipped disc | 1312 |
| | | Spine arthritis/spondylitis | 1311 |
| | | Ankylosing spondylitis | 1313 |
| | | Back problem | 1294 |
| | | Osteoarthritis | 1465 |
| | | Gout | 1466 |
| | | Cervical spondylosis | 1478 |
| | | Trigeminal neuralgia | 1523 |

| | | | |
|---|---|---|---|
| | | Disc degeneration | 1533 |
| | | Trapped nerve/compressed nerve | 1257 |
| 23 | Osteoporosis | Osteoporosis | 1309 |
| 24 | Thyroid disorders | Thyroid problem (not cancer) | 1224 |
| | | Hyperthroidism/thyrotoxicosis | 1225 |
| | | Hypothyroidism/myxoedema | 1226 |
| | | Grave's disease | 1522 |
| | | Thyroid goitre | 1610 |
| | | Thyroititis | 1428 |
| 25 | Alcohol problems | Alcohol dependency | 1408 |
| | | Alcoholic liver disease/alcoholic cirrhosis | 1604 |
| 26 | Chronic kidney disease | Polycystic kidney | 1427 |
| | | Diabetic nephropathy | 1607 |
| | | Renal/kidney failure | 1192 |
| | | Renal failure requiring dialysis | 1193 |
| | | Renal failure not requiring dialysis | 1194 |
| | | Kidney nephropathy | 1519 |
| | | Immunoglobulin A (IgA) nephropathy | 1520 |
| 27 | Prostate disorders | Prostate problem (not cancer) | 1207 |
| | | Enlarged prostate | 1396 |
| | | Benign prostatic hypertrophy | 1516 |
| 28 | Glaucoma | Glaucoma | 1277 |
| 29 | Epilepsy | Epilepsy | 1264 |
| 30 | Dementia | Dementia/Alzheimer/cognitive impairment | 1263 |
| 31 | Psoriasis or eczema | Eczema/dermatitis | 1452 |
| | | Psoriasis | 1453 |
| 32 | Migraine | Migraine | 1265 |
| 33 | Chronic sinusitis | Chronic sinusitis | 1416 |
| 34 | Anorexia or bulimia | Anorexia, bulimia/other eating disorder | 1470 |
| 35 | Parkinson's disease | Parkinson's disease | 1262 |
| 36 | Multiple sclerosis | Multiple sclerosis | 1261 |
| 37 | Chronic fatigue syndrome | Chronic fatigue syndrome | 1482 |
| 38 | Endometriosis | Endometriosis | 1402 |
| 39 | Meniere disease | Meniere disease | 1421 |
| 40 | Pernicious anaemia | Pernicious anaemia | 1331 |
| 41 | Polycystic ovaries | Polycystic ovaries | 1350 |

The list of disease groupings was based on Barnett et al (2012)

Table S4. Associations of sarcopenia symptoms with the risk of lung cancer incidence and mortality

| Variable | Lung cancer cases/ person-years | HR (95% CI) | | Lung cancer deaths/ person-years | HR (95% CI) | |
|---|---|---|---|---|---|---|
| | | Minimally-adjusted | Fully-adjusted | | Minimally-adjusted | Fully-adjusted |
| Normal control group | 2619/ 3,859,738 | Ref. | Ref. | 1532/3,927,610 | Ref. | Ref. |
| Low handgrip strength | 400/318,901 | **1.28(1.15-1.43)** | **1.11 (1.00-1.24)** | 216/325,095 | **1.16(1.00-1.34)** | 1.01(0.87-1.17) |
| Low muscle mass | 120/56,091 | **2.05(1.71-2.47)** | **1.51(1.23-1.85)** | 75/ 57,130 | **2.06(1.63-2.60)** | **1.48(1.14-1.92)** |
| Slow walking pace | 578/268,366 | **2.20(2.01-2.41)** | **1.49(1.34-1.65)** | 366/ 274,127 | **2.20(2.01-2.41)** | **1.54(1.35-1.75)** |

Three separate Cox proportional hazards regression models were performed to examine the associations of sarcopenia symptoms with the risk of lung cancer incidence and mortality, with individuals lacking all three sarcopenia symptoms serving as the reference group. Minimally-adjusted HR was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles). Fully-adjusted HR was adjusted for covariates included in minimally-adjusted HR plus body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; Ref, reference.

Table S5. Associations of sarcopenia symptoms with the risk of lung cancer incidence by age

| Variable | <60 years | | ≥60 years | | $P_{interaction}$ |
|---|---|---|---|---|---|
| | **Lung cancer cases/ person-years** | **HR (95% CI)** | **Lung cancer cases/ person-years** | **HR (95% CI)** | |
| Normal control group | 801/2,376,604 | Ref. | 1818/1,483,134 | Ref. | |
| Low handgrip strength | 107/126,494 | **1.72(1.39-2.13)** | 293/192,407 | 1.07(0.94-1.22) | **<0.0001** |
| Low muscle mass | 35/22,673 | **2.81(1.88-4.19)** | 85/33,417 | **1.46(1.14-1.86)** | **0.0009** |
| Slow walking pace | 153/123,756 | **1.76(1.44-2.15)** | 425/144,611 | **1.50(1.33-1.69)** | **0.0047** |

The Cox proportional hazards regression was performed to examine the associations of sarcopenia symptoms with the risk of lung cancer incidence stratified by age. The model was adjusted for sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; Ref, reference.

Table S6. Associations of sarcopenia symptoms with the risk of lung cancer mortality by age

| Variable | <60 years | | ≥60 years | | $P_{interaction}$ |
|---|---|---|---|---|---|
| | **Lung cancer deaths/ person-years** | **HR (95% CI)** | **Lung cancer deaths/ person-years** | **HR (95% CI)** | |
| Normal control group | 454/2,418,287 | Ref. | 1078/1,509,323 | Ref. | |
| Low handgrip strength | 58/128,951 | **1.61(1.21-2.15)** | 158/196,144 | 0.98(0.83-1.17) | **0.0001** |
| Low muscle mass | 13/23,062 | 1.69(0.89-3.20) | 62/34,068 | **1.65(1.24-2.20)** | 0.8550 |
| Slow walking pace | 92/126,417 | **1.75(1.35-2.27)** | 274/147,710 | **1.58(1.36-1.84)** | **0.0454** |

The Cox proportional hazards regression was performed to examine the associations of sarcopenia symptoms with the risk of lung cancer mortality stratified by age. The model was adjusted for sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; Ref, reference.

Table S7. Associations of sarcopenia symptoms and the risk of lung cancer incidence by sex

| Variable | Women | | Men | | $P_{interaction}$ |
|---|---|---|---|---|---|
| | **Lung cancer cases/ person-years** | **HR (95% CI)** | **Lung cancer cases/ person-years** | **HR (95% CI)** | |
| Normal control group | 1250/ 2,045,803 | Ref. | 1369/1,813,935 | Ref. | |
| Low handgrip strength | 224/ 208,591 | 1.07(0.92-1.24) | 176/110,310 | 1.17(0.99-1.38) | 0.1225 |
| Low muscle mass | 22/ 15,952 | 1.54(0.95-2.49) | 98/ 40,139 | **1.48(1.16-1.88)** | 0.7984 |
| Slow walking pace | 267 151,751 | **1.51(1.30-1.75)** | 311/ 116,616 | **1.47(1.28-1.69)** | 0.4234 |

The Cox proportional hazards regression was performed to examine the associations of sarcopenia symptoms with the risk of lung cancer incidence stratified by sex. The was adjusted for age, Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; Ref, reference.

Table S8. Associations of sarcopenia symptoms with the risk of lung cancer mortality by sex

| Variable | Women | | Men | | $P_{interaction}$ |
|---|---|---|---|---|---|
| | **Lung cancer deaths/ person-years** | **HR (95% CI)** | **Lung cancer deaths/ person-years** | **HR (95% CI)** | |
| Normal control group | 683/2,082,594 | Ref. | 849/1,845,016 | Ref. | |
| Low handgrip strength | 123/212,789 | 1.05(0.86-1.28) | 93/112,307 | 0.98(0.79-1.23) | 0.9983 |
| Low muscle mass | 14/ 16,228 | **1.84(1.00-3.37)** | 61/ 40,902 | **1.38(1.02-1.87)** | 0.7119 |
| Slow walking pace | 171/ 155,012 | **1.70(1.39-2.05)** | 195/ 119,115 | **1.42(1.19-1.69)** | 0.4833 |

The Cox proportional hazards regression was performed to examine the associations of sarcopenia symptoms with the risk of lung cancer mortality stratified by sex. The model was adjusted for age, Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; Ref, reference.

Table S9. Factor loadings for PCA-derived dietary patterns

| | PCA-derived dietary patterns | | |
|---|---|---|---|
| | **Prudent pattern** | **Western pattern** | **Wholegrain Pattern** |
| Cooked vegetables | **0.58** | 0.07 | -0.02 |
| Salad raw vegetables | **0.65** | -0.04 | -0.02 |
| Fresh fruit | **0.56** | -0.10 | 0.12 |
| Dried fruit | **0.35** | -0.07 | 0.24 |
| Whole grain bread | 0.02 | -0.05 | **0.55** |
| Other bread | -0.17 | 0.16 | **-0.58** |
| Grain cereal | 0.07 | -0.05 | **0.75** |
| Other cereal | -0.01 | -0.02 | **-0.70** |
| Oily fish | **0.49** | 0.04 | 0.11 |
| Non-oily fish | **0.40** | 0.12 | 0.01 |
| Processed meat | -0.23 | **0.49** | -0.13 |
| Poultry | 0.15 | **0.42** | -0.02 |
| Beef | -0.06 | **0.66** | 0.00 |
| Lamb/mutton | 0.05 | **0.67** | 0.03 |
| Pork | -0.02 | **0.67** | 0.01 |
| Cheese | -0.15 | 0.05 | 0.15 |
| Tea | -0.01 | 0.05 | -0.02 |
| Coffee | -0.12 | 0.10 | 0.02 |
| Water | **0.46** | -0.07 | 0.02 |
| Variance explained, % | 10.35 | 9.62 | 9.45 |
| Cumulative variance, % | 10.35 | 19.97 | 29.42 |

Abbreviations: PCA, principal component analysis.

Table S10. Associations between carbohydrate types and the risk of lung cancer incidence and mortality

| Carbohydrate types | Lung cancer cases/person-years | HR (95% CI) | | Lung cancer deaths/person-years | HR (95% CI) | |
|---|---|---|---|---|---|---|
| | | Minimally-adjusted | Fully-adjusted | | Minimally-adjusted | Fully-adjusted |
| **Whole grain bread** | | | | | | |
| <5.0 servings/week | 2109/2,247,958 | Ref. | Ref. | 1266/2,289,204 | Ref. | Ref. |
| 5.0-9.9 servings/week | 377/ 607,467 | **0.68(0.61-0.76)** | **0.82(0.74-0.92)** | 204/618,094 | **0.63(0.54-0.73)** | **0.78(0.67-0.90)** |
| 10.0-13.9 servings/week | 343/532,081 | **0.72(0.64-0.81)** | **0.86(0.77-0.97)** | 196/541,352 | **0.70(0.60-0.81)** | **0.85(0.73-0.99)** |
| ≥14.0 servings/week | 703/ 1,045,338 | **0.68(0.62-0.74)** | **0.79(0.73-0.87)** | 407/1,063,508 | **0.65(0.58-0.73)** | **0.78(0.70-0.88)** |
| **Other bread** | | | | | | |
| <5.0 servings/week | 1854/2,883,109 | Ref. | Ref. | 1051/2,933,273 | Ref. | Ref. |
| 5.0-9.9 servings/week | 377/ 389,903 | **1.47(1.31-1.64)** | **1.24(1.11-1.39)** | 217/397,064 | **1.47(1.27-1.71)** | **1.22(1.05-1.41)** |
| 10.0-13.9 servings/week | 352/370,338 | **1.48(1.32-1.66)** | **1.21(1.08-1.36)** | 210/377,328 | **1.52(1.31-1.77)** | **1.22(1.05-1.42)** |
| ≥14.0 servings/week | 949/789,496 | **1.66(1.54-1.80)** | **1.32(1.22-1.43)** | 595/804,493 | **1.79(1.61-1.98)** | **1.38(1.24-1.53)** |
| **Grain cereal** | | | | | | |
| <2.0 servings/week | 2155/2,167,789 | Ref. | Ref. | 1306/2,207,826 | Ref. | Ref. |
| 2.0-4.9 servings/week | 348/506,413 | **0.71(0.63-0.80)** | **0.80(0.72-0.90)** | 208/515,102 | **0.71(0.61-0.82)** | **0.81(0.70-0.94)** |
| 5.0-6.9 servings/week | 319/604,999 | **0.57(0.51-0.64)** | **0.74(0.66-0.83)** | 178/615,384 | **0.54(0.46-0.63)** | **0.72(0.61-0.84)** |
| ≥7.0 servings/week | 710/1,153,645 | **0.55(0.51-0.60)** | **0.75(0.69-0.82)** | 381/1,173,847 | **0.49(0.44-0.55)** | **0.70(0.63-0.79)** |
| **Other cereal** | | | | | | |
| <2.0 servings/week | 2399/3,149,022 | Ref. | Ref. | 1388/3,204,527 | Ref. | Ref. |
| 2.0-4.9 servings/week | 385/362,833 | **1.50(1.35-1.67)** | **1.18(1.06-1.32)** | 237/369,885 | **1.58(1.37-1.81)** | **1.22(1.06-1.40)** |
| 5.0-6.9 servings/week | 270/337,679 | **1.18(1.04-1.34)** | **1.13(1.00-1.28)** | 157/343,696 | **1.18(1.00-1.40)** | 1.13(0.95-1.33) |
| ≥7.0 servings/week | 478/583,312 | 1.00(0.91-1.10) | 1.00(0.90-1.10) | 291/594,050 | 1.04(0.92-1.18) | 1.05(0.92-1.19) |

The Cox proportional hazards regression was performed to examine the associations between carbohydrate types and the risk of lung cancer incidence and mortality. Minimally-adjusted HR was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles). Fully-adjusted HR was adjusted for covariates included in minimally-adjusted HR plus body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2,

3, 4, ≥5), physical activity (vigorous, moderate, low). Abbreviations: CI, confidence interval; HR, hazard ratio; Ref, reference

Table S11. Associations between dietary patterns and the prevalence of sarcopenia symptoms

| Dietary pattern | Low handgrip strength | Low muscle mass | Slow walking pace |
|---|---|---|---|
| Prudent pattern OR (95% CI) | | | |
| Q1 | Ref. | Ref. | Ref. |
| Q2 | **0.90(0.87-0.94)** | **0.87(0.80-0.94)** | **0.83(0.80-0.87)** |
| Q3 | **0.87(0.84-0.90)** | **0.76(0.69-0.83)** | **0.76(0.73-0.79)** |
| Q4 | **0.88(0.85-0.91)** | **0.72(0.66-0.79)** | **0.75(0.72-0.78)** |
| per 1 SD increase | **0.96(0.95-0.98)** | **0.89(0.87-0.92)** | **0.91(0.89-0.92)** |
| Western pattern OR (95% CI) | | | |
| Q1 | Ref. | Ref. | Ref. |
| Q2 | 0.97(0.94-1.01) | 1.01(0.93-1.11) | **0.96(0.92-1.00)** |
| Q3 | 1.01(0.98-1.05) | 0.98(0.90-1.07) | 1.03(0.98-1.07) |
| Q4 | 1.02(0.99-1.06) | 1.07(0.98-1.17) | **1.17(1.13-1.22)** |
| per 1 SD increase | **1.03(1.01-1.04)** | 1.02(0.99-1.05) | **1.06(1.05-1.07)** |
| Wholegrain Pattern OR (95% CI) | | | |
| Q1 | Ref. | Ref. | Ref. |
| Q2 | **0.88(0.85-0.91)** | 0.97(0.89-1.06) | **0.88(0.84-0.91)** |
| Q3 | **0.79(0.76-0.82)** | **0.83(0.76-0.91)** | **0.73(0.70-0.76)** |
| Q4 | **0.72(0.70-0.75)** | **0.82(0.75-0.89)** | **0.61(0.59-0.64)** |
| per 1 SD increase | **0.88(0.87-0.89)** | **0.93(0.90-0.95)** | **0.85(0.84-0.86)** |

The logistic regression was used to examine the associations between dietary patterns and the prevalence of sarcopenia symptoms. OR was adjusted for age (continuous) , sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; OR, Odds ratio; Q, quartile; Ref, reference.

Table S12. Associations of carbohydrate types with the prevalence of sarcopenia symptoms

| Carbohydrate types | Low handgrip strength | Low muscle mass | Slow walking pace |
|---|---|---|---|
| **Whole grain bread OR (95% CI)** | | | |
| <5.0 servings/week | Ref. | Ref. | Ref. |
| 5.0-9.9 servings/week | **0.84(0.80-0.87)** | **0.78(0.70-0.88)** | **0.73(0.70-0.77)** |
| 10.0-13.9 servings/week | **0.84(0.80-0.87)** | **0.89(0.80-0.98)** | **0.71(0.67-0.75)** |
| ≥14.0 servings/week | **0.82(0.79-0.85)** | **0.89(0.83-0.96)** | **0.73(0.70-0.76)** |
| **Other bread OR (95% CI)** | | | |
| <5.0 servings/week | Ref. | Ref. | Ref. |
| 5.0-9.9 servings/week | **1.21(1.16-1.27)** | **1.29(1.14-1.44)** | **1.39(1.32-1.45)** |
| 10.0-13.9 servings/week | **1.26(1.21-1.32)** | **1.18(1.05-1.32)** | **1.38(1.31-1.45)** |
| ≥14.0 servings/week | **1.23(1.18-1.27)** | **1.19(1.10-1.29)** | **1.44(1.39-1.50)** |
| **Grain cereal OR (95% CI)** | | | |
| <2.0 servings/week | Ref. | Ref. | Ref. |
| 2.0-4.9 servings/week | **0.84(0.80-0.88)** | **0.77(0.68-0.87)** | **0.82(0.78-0.86)** |
| 5.0-6.9 servings/week | **0.80(0.77-0.84)** | **0.81(0.72-0.90)** | **0.69(0.66-0.73)** |
| ≥7.0 servings/week | **0.83(0.80-0.85)** | **0.85(0.79-0.92)** | **0.71(0.68-0.74)** |
| **Other cereal OR (95% CI)** | | | |
| <2.0 servings/week | Ref. | Ref. | Ref. |
| 2.0-4.9 servings/week | **1.18(1.12-1.24)** | 1.13(1.00-1.29) | **1.28(1.22-1.34)** |
| 5.0-6.9 servings/week | **1.18(1.12-1.24)** | 0.95(0.83-1.09) | **1.15(1.09-1.21)** |
| ≥7.0 servings/week | **1.17(1.13-1.21)** | 1.07(0.98-1.17) | **1.12(1.07-1.16)** |

The logistic regression was used to examine the associations between carbohydrate types and the prevalence of sarcopenia symptoms. OR was adjusted for age (continuous) , sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; OR, Odds ratio; Ref, reference.

Table S13. Associations of sarcopenia symptoms with incidence of lung cancer subtypes

| | | Normal control group | **Low handgrip strength** | **Low muscle mass** | **Slow walking pace** |
|---|---|---|---|---|---|
| LUAD | Cases/person-years | 916/3,862,726 | 122/319,439 | 33/56,231 | 154/269,087 |
| | HR (95% CI) | Ref. | 0.99(0.82-1.21) | 1.38(0.94-2.02) | **1.27(1.05-1.54)** |
| LSCC | Cases/person-years | 361/3,864,088 | 76/319,525 | 27/56,282 | 121/269,172 |
| | HR (95% CI) | Ref. | **1.36(1.05-1.77)** | **1.94(1.25-3.02)** | **1.72(1.36-2.18)** |
| SCLC | Cases/person-years | 209/3,864,635 | 24/319,724 | 7/56,312 | 43/269,406 |
| | HR (95% CI) | Ref. | 0.80(0.51-1.23) | 1.50(0.65-3.47) | 1.15(0.80-1.65) |

The Cox proportional hazards regression was performed to examine the associations between sarcopenia symptoms and incidence of lung cancer subtypes. The model was adjusted for age (continuous), sex (men, women), Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low). Abbreviations: CI, confidence interval; HR, hazard ratio; LSCC, lung squamous cell carcinoma; LUAD, lung adenocarcinoma; Ref, reference; SCLC, small cell lung cancer.

Table S14. Associations between dietary patterns and incidence of lung cancer subtypes

| Dietary pattern | LUAD | | LSCC | | SCLC | |
|---|---|---|---|---|---|---|
| | Cases/person-years | HR (95% CI) | Cases/person-years | HR (95% CI) | Cases/person-years | HR (95% CI) |
| Prudent pattern | | | | | | |
| Q1 | 322/1,106,495 | Ref. | 194/1,106,819 | Ref. | 96/1,107,131 | Ref. |
| Q2 | 297/1,108,896 | 1.01(0.86-1.19) | 144/1,109,322 | 0.99(0.80- 1.23) | 67/1,109,531 | 0.86(0.63-1.18) |
| Q3 | 259/1,111,348 | 0.86(0.73-1.02) | 98/1,111,694 | **0.70(0.55-0.90)** | 54/1,111,871 | **0.70(0.49-0.98)** |
| Q4 | 302/1,110,226 | 0.97(0.82-1.14) | 106/1,110,717 | **0.76(0.59-0.96)** | 53/1,110,930 | **0.67(0.48-0.95)** |
| per 1 SD increase | | 0.98(0.93-1.03) | | **0.89(0.82-0.96)** | | **0.87(0.78-0.97)** |
| Western pattern | | | | | | |
| Q1 | 258/1,112,843 | Ref. | 90/1,113,310 | Ref. | 51/1,113,463 | Ref. |
| Q2 | 287/1,109,568 | 1.09(0.92-1.29) | 114/1,109,916 | 1.17(0.89-1.54) | 51/1,110,176 | 0.962(0.62-1.36) |
| Q3 | 287/1,108,671 | 1.07(0.90-1.27) | 130/1,109,099 | 1.22(0.93-1.61) | 68/1,109,309 | 1.15(0.80-1.66) |
| Q4 | 348/1,105,883 | **1.20(1.02-1.42)** | 208/1,106,228 | **1.58(1.22-2.03)** | 100/1,106,514 | **1.43(1.01-2.03)** |
| per 1 SD increase | | **1.06(1.00-1.12)** | | **1.14(1.06-1.22)** | | **1.15(1.04-1.28)** |
| Wholegrain Pattern | | | | | | |
| Q1 | 352/1,104,131 | Ref. | 196/1,104,426 | Ref. | 105/1,104,781 | Ref. |
| Q2 | 323/1,108,049 | 0.95(0.81-1.10) | 177/1,108,485 | 1.05(0.85-1.28) | 76/1,108,775 | 0.80(0.59-1.07) |
| Q3 | 268/1,111,794 | 0.86(0.73-1.01) | 88/1,112,307 | **0.66(0.51-0.86)** | 49/1,112,421 | **0.64(0.45-0.90)** |
| Q4 | 237/1,112,991 | **0.80(0.67-0.94)** | 81/1,113,334 | **0.65(0.50-0.85)** | 40/1,113,485 | **0.60(0.42-0.87)** |
| per 1 SD increase | | **0.92(0.87-0.98)** | | **0.85(0.79-0.93)** | | **0.83(0.74-0.94)** |

The Cox proportional hazards regression was performed to examine the associations between dietary patterns and incidence of lung cancer subtypes. The model was adjusted for age (continuous), sex (men, women), Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low). Abbreviations: CI, confidence interval; HR, hazard ratio; LSCC, lung squamous cell carcinoma; LUAD, lung adenocarcinoma; Q, quartile; Ref, reference; SCLC, small cell lung cancer; SD, standard deviation.

Table S15. Associations of sarcopenia symptoms with incidence of lung cancer by subgroups

| | Normal control group | **Low handgrip strength** | $P_{interaction}$ | **Low muscle mass** | $P_{interaction}$ | **Slow walking pace** | $P_{interaction}$ |
|---|---|---|---|---|---|---|---|
| **Townsend deprivation index** | | | 0.1338 | | 0.8282 | | 0.0023 |
| Below median value | Ref. | 1.01(0.83-1.22) | | 1.58(1.12-2.23) | | 1.19(0.98-1.45) | |
| Above median value | Ref. | 1.20(1.05-1.37) | | 1.47(1.14-1.91) | | 1.71(1.47-1.98) | |
| **Body mass index** | | | 0.8500 | | 0.7819 | | 0.0010 |
| <25 | Ref. | 1.11(0.91-1.35) | | 1.50(1.22-1.84) | | 1.69(1.36-2.08) | |
| 25-29.9 | Ref. | 1.16(0.98-1.38) | | 1.43(0.20-10.13) | | 1.61(1.37-1.90) | |
| ≥30 | Ref. | 1.13(0.92-1.39) | | / | | 1.30(1.11-1.53) | |
| **Alcohol frequency** | | | 0.2433 | | 0.1295 | | 0.2134 |
| ≥3 or 4 times a week | Ref. | 1.03(0.86-1.23) | | 1.68(1.29-2.19) | | 1.60(1.36-1.88) | |
| <3 or 4 times a week | Ref. | 1.20(1.04-1.37) | | 1.29(0.93-1.79) | | 1.46(1.28-1.66) | |
| **Smoking status** | | | 0.0115 | | 0.2280 | | 0.1999 |
| Never | Ref. | 0.87(0.65-1.17) | | 1.10(0.56-2.18) | | 0.91(0.63-1.32) | |
| Former smokers | Ref. | 1.10(0.94-1.29) | | 2.08(1.46-2.98) | | 1.61(1.39-1.87) | |
| Current smokers | Ref. | 1.26(1.06-1.50) | | 1.23(0.93-1.62) | | 1.46(1.25-1.70) | |
| **Family history of cancer** | | | 0.4607 | | 0.5086 | | 0.5819 |
| No | Ref. | 1.08(0.93-1.25) | | 1.40(1.06-1.85) | | 1.54(1.35-1.77) | |
| Yes | Ref. | 1.15(0.98-1.35) | | 1.67(1.22-2.27) | | 1.42(1.22-1.66) | |
| **No. of long-term conditions** | | | 0.1410 | | 0.4141 | | 0.1478 |
| None | Ref. | 1.12(0.85-1.47) | | 1.43(0.96-2.13) | | 1.28(0.90-1.83) | |
| One | Ref. | 0.90(0.72-1.12) | | 1.55(1.08-2.21) | | 1.35(1.10-1.66) | |
| Two or more | Ref. | 1.28(1.11-1.48) | | 1.56(1.12-2.17) | | 1.65(1.46-1.87) | |

The Cox proportional hazards regression was performed to examine the associations between sarcopenia symptoms and incidence of lung cancer by subgroups. The model was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration.

Table S16. Associations of sarcopenia symptoms with mortality of lung cancer by subgroups

| | Normal control group | **Low handgrip strength** | $P_{interaction}$ | **Low muscle mass** | $P_{interaction}$ | **Slow walking pace** | $P_{interaction}$ |
|---|---|---|---|---|---|---|---|
| **Townsend deprivation index** | | | 0.0156 | | 0.8605 | | 0.0027 |
| Below median value | Ref. | 0.77(0.57-1.03) | | 1.49(0.95-2.33) | | 1.16(0.89-1.51) | |
| Above median value | Ref. | 1.15(0.96-1.36) | | 1.49(1.08-2.06) | | 1.71(1.47-1.98) | |
| **Body mass index** | | | 0.5794 | | | | 0.0020 |
| <25 | Ref. | 1.00(0.77-1.30) | | 1.43(1.10-1.86) | 0.9288 | 1.60(1.22-2.09) | |
| 25-29.9 | Ref. | 1.07(0.85-1.35) | | / | | 1.80(1.47-2.20) | |
| ≥30 | Ref. | 1.00(0.75-1.33) | | / | | 1.29(1.04-1.59) | |
| **Alcohol frequency** | | | 0.0946 | | 0.1168 | | 0.3843 |
| ≥3 or 4 times a week | Ref. | 0.87(0.68-1.11) | | 1.76(1.27-2.44) | | 1.66(1.35-2.03) | |
| <3 or 4 times a week | Ref. | 1.13(0.94-1.37) | | 1.13(0.73-1.76) | | 1.50(1.27-1.78) | |
| **Smoking status** | | | 0.0109 | | 0.5605 | | 0.1916 |
| Never | Ref. | 0.74(0.45-1.20) | | 1.48(0.59-3.71) | | 0.84(0.48-1.50) | |
| Former smokers | Ref. | 0.91(0.73-1.14) | | 1.95(1.22-3.12) | | 1.59(1.31-1.93) | |
| Current smokers | Ref. | 1.21(0.97-1.50) | | 1.18(0.84-1.66) | | 1.52(1.27-1.83) | |
| **Family history of cancer** | | | 0.1329 | | 0.8943 | | 0.9191 |
| No | Ref. | 0.90(0.73-1.10) | | 1.47(1.04-2.06) | | 1.51(1.27-1.80) | |
| Yes | Ref. | 1.16(0.93-1.44) | | 1.53(1.02-2.29) | | 1.56(1.28-1.90) | |
| **No. of long-term conditions** | | | 0.1731 | | 0.6555 | | 0.3345 |
| None | Ref. | 1.03(0.72-1.49) | | 1.56(0.95-2.57) | | 1.36(0.88-2.11) | |
| One | Ref. | 0.73(0.54-1.00) | | 1.51(0.97-2.35) | | 1.35(1.05-1.76) | |
| Two or more | Ref. | 1.17(0.97-1.41) | | 1.36(0.89-2.08) | | 1.66(1.41-1.94) | |

The Cox proportional hazards regression was performed to examine the associations between sarcopenia symptoms and mortality of lung cancer by subgroups. The model was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration.

Table S17. Associations between dietary patterns and incidence of lung cancer by subgroups

| Covariate | Prudent pattern | | Western pattern | | Wholegrain pattern | |
|---|---|---|---|---|---|---|
| | per 1 SD increase HR (95%CI) | $P_{interaction}$ | per 1 SD increase HR (95%CI) | $P_{interaction}$ | per 1 SD increase HR (95%CI) | $P_{interaction}$ |
| **Sex** | | 0.3905 | | 0.2197 | | 0.3912 |
| Women | 0.95(0.90-1.00) | | 1.08(1.02-1.13) | | 0.90(0.85-0.95) | |
| Men | 0.92(0.88-0.97) | | 1.12(1.07-1.16) | | 0.88(0.84-0.91) | |
| **Townsend deprivation index** | | 0.8722 | | 0.0408 | | 0.5695 |
| Below median value | 0.93(0.87-0.98) | | 1.05(1.00-1.11) | | 0.89(0.84-0.94) | |
| Above median value | 0.94(0.90-0.98) | | 1.12(1.08-1.17) | | 0.88(0.85-0.92) | |
| **Body mass index** | | 0.0524 | | 0.0524 | | 0.2077 |
| <25 | 0.93(0.88-0.99) | | 1.14(1.08-1.20) | | 0.88(0.83-0.94) | |
| 25-29.9 | 0.92(0.87-0.97) | | 1.08(1.03-1.13) | | 0.88(0.84-0.93) | |
| ≥30 | 0.97(0.91-1.04) | | 1.07(1.01-1.14) | | 0.91(0.85-0.97) | |
| **Alcohol frequency** | | 0.1452 | | 0.0734 | | 0.0017 |
| ≥3 or 4 times a week | 0.91(0.86-0.96) | | 1.13(1.09-1.18) | | 0.83(0.79-0.87) | |
| <3 or 4 times a week | 0.96(0.91-1.00) | | 1.07(1.02-1.11) | | 0.93(0.89-0.97) | |
| **Smoking status** | | 0.0001 | | 0.1779 | | 0.0137 |
| Never | 1.04(0.96-1.13) | | 0.97(0.89-1.06) | | 0.95(0.87-1.03) | |
| Former smokers | 0.97(0.92-1.02) | | 1.13(1.08-1.18) | | 0.88(0.84-0.92) | |
| Current smokers | 0.86(0.81-0.91) | | 1.10(1.05-1.16) | | 0.88(0.83-0.93) | |
| **Family history of cancer** | | 0.1418 | | 0.6420 | | 0.1778 |
| No | 0.91(0.87-0.96) | | 1.10(1.06-1.15) | | 0.90(0.86-0.94) | |
| Yes | 0.97(0.92-1.02) | | 1.09(1.04-1.15) | | 0.86(0.82-0.91) | |
| **No. of long-term conditions** | | 0.6027 | | 0.1827 | | 0.1869 |
| None | 0.94(0.88-1.01) | | 1.07(1.01-1.14) | | 0.92(0.86-0.98) | |
| One | 0.92(0.87-0.98) | | 1.09(1.03-1.15) | | 0.88(0.83-0.93) | |
| Two or more | 0.94(0.90-0.99) | | 1.12(1.07-1.17) | | 0.88(0.83-0.92) | |

The Cox proportional hazards regression was performed to examine the associations between dietary patterns and mortality of lung cancer by subgroups. The model was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low).

Table S18. Associations between dietary patterns and mortality of lung cancer by subgroups

| Covariate | Prudent pattern | | Western pattern | | Wholegrain pattern | |
|---|---|---|---|---|---|---|
| | per 1 SD increase HR (95%CI) | $P_{interaction}$ | per 1 SD increase HR (95%CI) | $P_{interaction}$ | per 1 SD increase HR (95%CI) | $P_{interaction}$ |
| **Sex** | | 0.6800 | | 0.3428 | | 0.4218 |
| Women | 0.95(0.89-1.02) | | 1.09(1.02-1.16) | | 0.88(0.82-0.95) | |
| Men | 0.93(0.87-0.99) | | 1.13(1.08-1.18) | | 0.85(0.81-0.90) | |
| **Townsend deprivation index** | | 0.1993 | | 0.1100 | | 0.2266 |
| Below median value | 0.89(0.82-0.97) | | 1.06(0.99-1.14) | | 0.88(0.82-0.95) | |
| Above median value | 0.96(0.91-1.02) | | 1.14(1.09-1.19) | | 0.85(0.81-0.90) | |
| **Body mass index** | | 0.0284 | | 0.2146 | | 0.3166 |
| <25 | 0.91(0.84-0.99) | | 1.15(1.07-1.23) | | 0.88(0.81-0.95) | |
| 25-29.9 | 0.93(0.86-1.00) | | 1.09(1.02-1.16) | | 0.85(0.79-0.90) | |
| ≥30 | 0.99(0.91-1.08) | | 1.10(1.02-1.19) | | 0.89(0.82-0.97) | |
| **Alcohol frequency** | | 0.0316 | | 0.1552 | | 0.0032 |
| ≥3 or 4 times a week | 0.88(0.82-0.95) | | 1.15(1.09-1.21) | | 0.80(0.75-0.85) | |
| <3 or 4 times a week | 0.98(0.93-1.04) | | 1.08(1.02-1.14) | | 0.92(0.87-0.97) | |
| **Smoking status** | | 0.0967 | | 0.7724 | | 0.1972 |
| Never | 1.04(0.91-1.18) | | 0.98(0.86-1.13) | | 0.96(0.84-1.08) | |
| Former smokers | 0.95(0.88-1.01) | | 1.16(1.09-1.23) | | 0.85(0.80-0.91) | |
| Current smokers | 0.91(0.84-0.97) | | 1.09(1.03-1.15) | | 0.86(0.80-0.92) | |
| **Family history of cancer** | | 0.0165 | | 0.7102 | | 0.5454 |
| No | 0.89(0.84-0.95) | | 1.12(1.06-1.18) | | 0.87(0.83-0.92) | |
| Yes | 1.00(0.94-1.07) | | 1.11(1.04-1.18) | | 0.85(0.79-0.91) | |
| **No. of long-term conditions** | | 0.2058 | | 0.1332 | | 0.2580 |
| None | 0.97(0.89-1.07) | | 1.10(1.01-1.20) | | 0.91(0.83-0.99) | |
| One | 0.92(0.85-1.00) | | 1.05(0.97-1.12) | | 0.84(0.78-0.90) | |
| Two or more | 0.94(0.88-1.00) | | 1.17(1.10-1.24) | | 0.86(0.81-0.92) | |

The Cox proportional hazards regression was performed to examine the associations between dietary patterns and mortality of lung cancer by subgroups. The model was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low).

Table S19. Associations of sarcopenia symptoms and dietary patterns with incidence and mortality of cancer after excluding those developed lung cancer or died within two years of follow up (n=361,422)

| Variables | | Lung cancer cases/person-years | HR (95% CI) | Lung cancer deaths/person-years | HR (95% CI) |
|---|---|---|---|---|---|
| Sarcopenia status | Normal control group | 2375/3,859,470 | Ref. | 1342/3,926,678 | Ref. |
| | Low handgrip strength | 366/318,861 | **1.13(1.00-1.26)** | 193/324,935 | 1.04(0.89-1.22) |
| | Low muscle mass | 104/56,074 | **1.44(1.15-1.79)** | 62/57,069 | **1.39(1.04-1.85)** |
| | Slow walking pace | 510/268,292 | **1.45(1.30-1.62)** | 313/273,879 | **1.50(1.31-1.73)** |
| Prudent pattern | Q1 | 969/1,105,316 | Ref. | 574/1,125,244 | Ref. |
| | Q2 | 781/1,107,779 | 0.94(0.85-1.03) | 452/1,127,357 | 0.95(0.84-1.08) |
| | Q3 | 716/1,110,198 | **0.85(0.77-0.94)** | 385/1,129,546 | **0.81(0.71-0.93)** |
| | Q4 | 725/1,109,175 | **0.84(0.76-0.93)** | 398/1,128,705 | **0.83(0.72-0.94)** |
| Western pattern | Q1 | 664/1,111,618 | Ref. | 350/1,131,898 | Ref. |
| | Q2 | 711/1,108,554 | 1.03(0.92-1.14) | 393/1,128,810 | 1.07(0.92-1.23) |
| | Q3 | 803/1,107,476 | **1.12(1.00-1.24)** | 464/1,126,992 | **1.20(1.04-1.38)** |
| | Q4 | 1013/1,104,820 | **1.25(1.13-1.38)** | 602/1,123,152 | **1.35(1.18-1.55)** |
| Wholegrain pattern | Q1 | 1024/1,103,103 | Ref. | 616/1,123,809 | Ref. |
| | Q2 | 913/1,106,805 | 0.96(0.88-1.05) | 518/1,126,506 | 0.92(0.81-1.03) |
| | Q3 | 684/1,110,661 | **0.82(0.74-0.91)** | 368/1,129,927 | **0.76(0.67-0.87)** |
| | Q4 | 570/1,111,900 | **0.72(0.65-0.80)** | 307/1,130,610 | **0.68(0.59-0.78)** |

The Cox proportional hazards regression was performed to examine the associations sarcopenia symptoms and dietary patterns with incidence and mortality of cancer after excluding those developed lung cancer or died within two years of follow up. The model was adjusted for age (continuous), sex (men, women) and Townsend deprivation index (in quintiles), body mass index (<18.5, 18.5-24.9, 25-29.9, or ≥30 kg/m2), alcohol frequency (daily or almost daily, 3 or 4 times a week, 1 or 2 times a week, 1 to 3 times a month, special occasions only, never, or unknown), smoking status (never, former, current, or unknown), family history of cancer (yes, no, or unknown), No. of long-term conditions (0, 1, 2, 3, 4, ≥5), physical activity (vigorous, moderate, low), sleep duration. Abbreviations: CI, confidence interval; HR, hazard ratio; Q, quartile; Ref, reference.