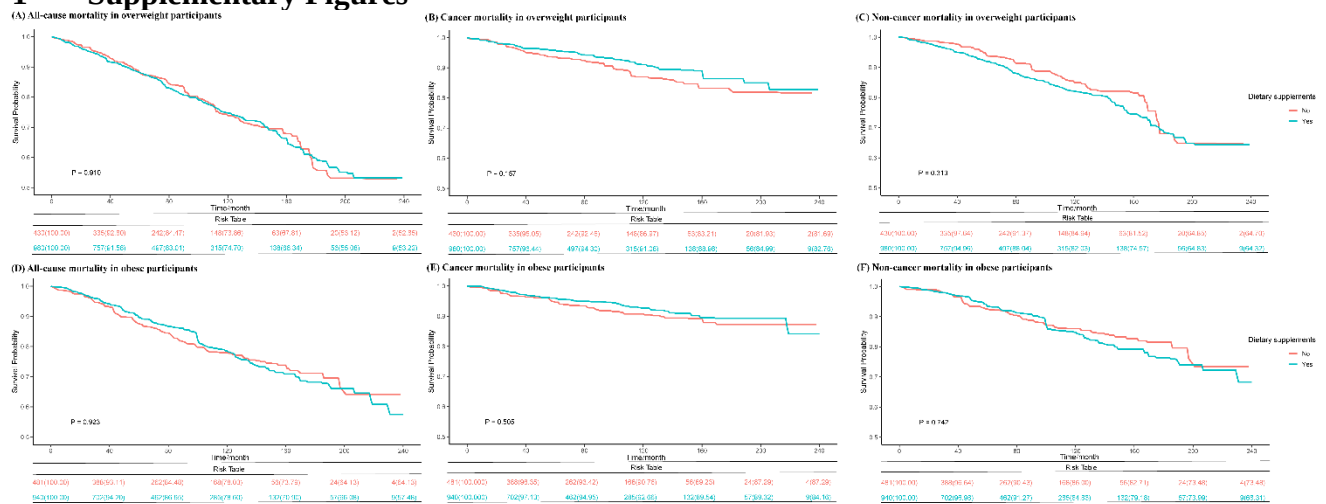
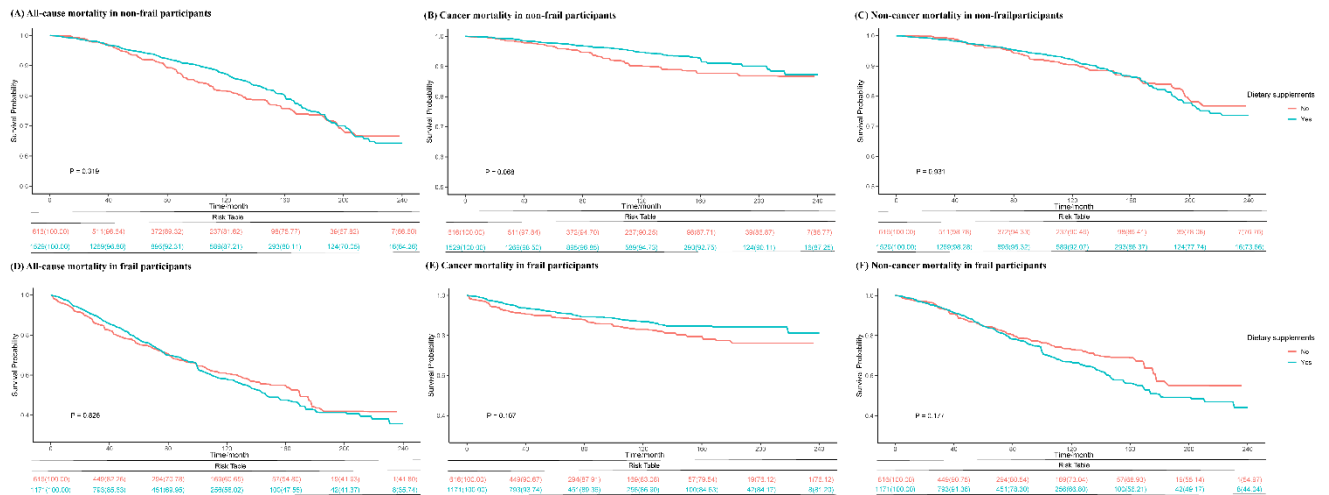


Supplementary Material

1 Supplementary Figures



Supplementary Figure 1. Kaplan-Meier survival curves between dietary supplements and all-cause, cancer, and non-cancer mortality in $25 \leq \text{BMI} < 30 \text{ kg/m}^2$ and $\text{BMI} \geq 30 \text{ kg/m}^2$ group. Abbreviation: BMI, body mass index.



Supplementary Figure 2. Kaplan-Meier survival curves between dietary supplements and all-cause, cancer, and non-cancer mortality in non-frail and frail group.

2 Supplementary Tables

Supplementary Table 1. Variables in the 49-Item Frailty Index and Their Respective Scorings.

Variable	Scoring
Cognition	
1. Experience confusion/memory problems	Yes = 1, No = 0
Dependence	
2. Managing money	Difficulty = 1, No Difficulty = 0
3. Stooping, crouching, kneeling	Difficulty = 1, No Difficulty = 0
4. Lifting or carrying	Difficulty = 1, No Difficulty = 0
5. House chore	Difficulty = 1, No Difficulty = 0
6. Preparing meals	Difficulty = 1, No Difficulty = 0
7. Standing up from armless chair	Difficulty = 1, No Difficulty = 0
8. Getting in and out of bed difficulty	Difficulty = 1, No Difficulty = 0
9. Using fork, knife, drinking from cup	Difficulty = 1, No Difficulty = 0
10. Dressing yourself	Difficulty = 1, No Difficulty = 0
11. Standing for long periods difficulty	Difficulty = 1, No Difficulty = 0
12. Grasp/holding small objects	Difficulty = 1, No Difficulty = 0
13. Attending social event	Difficulty = 1, No Difficulty = 0
14. Push or pull large objects	Difficulty = 1, No Difficulty = 0
15. Walking for a quarter mile difficulty	Difficulty = 1, No Difficulty = 0
16. Walking up 10 steps difficulty	Difficulty = 1, No Difficulty = 0
Depressive Symptoms	
17. Have little interest in doing things	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0
18. Feeling down, depressed, or hopeless	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0
19. Trouble sleeping or sleeping too much	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0
20. Feeling tired or having little energy	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0

Variable	Scoring
21. Poor appetite or overeating	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0
22. Feeling bad about yourself	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0
23. Trouble concentrating on things	Nearly every day = 1, More than half the days = 0.66, Several days = 0.33, Not at all = 0
Comorbidities	
24. Arthritis	Yes = 1, Suspect = 0.5 No = 0
25. Thyroid problems	Yes = 1, Suspect = 0.5 No = 0
26. Chronic bronchitis	Yes = 1, Suspect = 0.5 No = 0
27. Cancer	Yes = 1, Suspect = 0.5 No = 0
28. Congestive heart failure	Yes = 1, Suspect = 0.5 No = 0
29. Coronary heart disease	Yes = 1, Suspect = 0.5 No = 0
30. Angina	Yes = 1, Suspect = 0.5 No = 0
31. Heart attack	Yes = 1, Suspect = 0.5 No = 0
32. Stroke	Yes = 1, Suspect = 0.5 No = 0
33. Blood pressure	Yes = 1, Suspect = 0.5 No = 0
34. Diabetes	Yes = 1, Suspect = 0.5 No = 0
35. weak/failing kidneys	Yes = 1, Suspect = 0.5 No = 0
36. Urinary Leakage	Yes = 1, Suspect = 0.5 No = 0
Hospital Utilization and Access to Care	
37. Self-rated health	Fair, poor = 1, Excellent, Very good, good = 0
38. Health now compared with 1 year ago	Worse = 1, About the same, better = 0
39. Overnight hospital patient in past year	Yes = 1, No = 0
40. Frequency of health care use during past year	None = 0, 1–5 = 0.5, More than 5 = 1
41. Number of prescribed medications	None = 0, 1–4 = 0.5, 5 and more = 1
Physical Performance and	

Variable	Scoring	
Anthropometry		
42. Body mass index	$<18.5 \text{ km/m}^2$ or $\geq 30 \text{ km/m}^2 = 1$ $>25 \text{ km/m}^2$ and $<30 \text{ km/m}^2 = 0.5$ $18.5\text{--}25 \text{ km/m}^2 = 0$	
43. Handgrip strength	MALE: For BMI $\leq 24 \text{ km/m}^2$, GS ≤ 29 For BMI $24.1\text{--}28 \text{ km/m}^2$, GS ≤ 30 For BMI $>28 \text{ km/m}^2$, GS $\leq 32 = 1$	FEMALE: For BMI $\leq 23 \text{ km/m}^2$, GS ≤ 17 For BMI $23.1\text{--}26 \text{ km/m}^2$, GS ≤ 17.3 For BMI $26.1\text{--}29 \text{ km/m}^2$, GS ≤ 18 For BMI $>29 \text{ km/m}^2$, GS $\leq 21 = 1$
Laboratory Values		
44. Glycohemoglobin (%)	$0\%\text{--}5.7\% = 0$, $>5.7\% = 1$	
45. Red blood cell count (million cells/ μL)	M: $4.7\text{--}6.1 = 0$, Other = 1	F: $4.2\text{--}5.4 = 0$, Other = 1
46. Hemoglobin (g/dL)	M: $13.5\text{--}18 = 0$, Other = 1	F: $12\text{--}16 = 0$, Other = 1
47. Red cell distribution width (%)	$11.6\text{--}14.6 = 0$, Other = 1	
48. Lymphocyte percent (%)	$20\text{--}40 = 0$, Other = 1	
49. Segmented neutrophils percent (%)	$40\text{--}80 = 0$, Other = 1	

Supplementary Table 2. Collinearity analysis.

Variables	VIF
Age	3.55
Gender	1.86
Race/ethnicity	6.52
Education	3.10
Marital status	2.41
Smoking	2.58
Alcohol consumption	1.82
BMI	2.66
Frailty index	2.24
HEI–2015	2.22
Physical activity	1.61
Hypertension	2.10
Hyperlipidemia	1.63
Diabetes	1.65
CCI	1.75
Dietary supplements	1.53

Abbreviations: VIF, variance inflation factor; BMI, body mass index; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.

Supplementary Table 3. Survey-weighted associations between dietary supplements and all-cause, cancer and non-cancer mortality among cancer survivors in different BMI (kg/m²) groups.

Cancer and non-cancer mortality among cancer survivors in different BMI (kg/m ²) groups								
	Death, n	Weighted death (%)	Univariable model		Model 1		Model 2	
			HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
BMI < 25 kg/m²								
All-cause mortality								
No	133	32.58	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	274	24.87	0.69(0.51,0.94)	0.017	0.60(0.45,0.81)	< 0.001	0.63(0.47,0.84)	0.002
Cancer mortality								
No	54	13.65	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	79	6.77	0.47(0.28,0.77)	0.003	0.47(0.28,0.77)	0.003	0.48(0.29,0.80)	0.005
Non-cancer mortality								
No	79	18.93	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	195	18.10	0.85(0.57,1.28)	0.438	0.69(0.46,1.05)	0.083	0.75(0.50,1.13)	0.167
25 ≤ BMI < 30 kg/m²								
All-cause mortality								
No	145	25.76	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	313	25.77	1.01(0.79,1.30)	0.911	0.95(0.75,1.21)	0.704	1.13(0.87,1.45)	0.363
Cancer mortality								
No	62	10.91	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	91	8.11	0.76(0.53,1.10)	0.151	0.75(0.51,1.11)	0.748	0.85(0.57,1.27)	0.433
Non-cancer mortality								
No	83	14.85	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	222	17.67	1.20(0.84,1.71)	0.317	1.10(0.78,1.56)	0.582	1.30(0.89,1.89)	0.168
BMI ≥ 30 kg/m²								
All-cause mortality								
No	130	20.75	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	216	19.15	0.98(0.70,1.38)	0.925	0.90(0.62,1.29)	0.552	0.91(0.64,1.28)	0.581
Cancer mortality								
No	52	7.87	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	78	6.27	0.85(0.52,1.37)	0.498	0.80(0.49,1.32)	0.382	0.89(0.56,1.42)	0.623
Non-cancer mortality								
No	78	12.88	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	138	12.88	1.07(0.73,1.57)	0.741	0.95(0.61,1.50)	0.838	0.90(0.57,1.42)	0.658

Model 1 was adjusted for age, gender, race/ethnicity, education level, and marital status; Model 2 was additionally adjusted for smoking, alcohol consumption, HEI-2015, physical activity, frailty index, hypertension, hyperlipidemia and diabetes history, and CCI. Abbreviations: CVD, cardiovascular disease; BMI, body mass index; HR, hazard ratio; CI, confidence interval; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.

Supplementary Table 4. Survey-weighted associations between dietary supplements and all-cause, cancer and non-cancer mortality among cancer survivors in different frailty groups.

	Death, n	Weighted death (%)	Univariable model		Model 1		Model 2	
			HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
Frailty index ≤ 0.2 (Non-frail)								
All-cause mortality								
No	151	17.70	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	332	16.08	0.87(0.66,1.15)	0.321	0.78(0.60,1.00)	0.051	0.77(0.60,0.99)	0.041
Cancer mortality								
No	66	7.82	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	102	5.49	0.68(0.46,1.01)	0.057	0.63(0.43,0.95)	0.025	0.59(0.39,0.89)	0.011
Non-cancer mortality								
No	85	9.88	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	230	10.59	1.02(0.69,1.50)	0.931	0.89(0.63,1.26)	0.524	0.95(0.65,1.38)	0.782
Frailty index > 0.2 (Frail)								
All-cause mortality								
No	257	25.86	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	471	23.23	1.03(0.79,1.34)	0.826	0.90(0.69,1.19)	0.462	0.95(0.73,1.22)	0.672
Cancer mortality								
No	102	10.57	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	146	7.08	0.72(0.49,1.06)	0.096	0.69(0.46,1.04)	0.073	0.76(0.51,1.13)	0.175
Non-cancer mortality								
No	155	15.29	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	325	16.15	1.23(0.91,1.66)	0.179	1.03(0.74,1.43)	0.854	1.07(0.79,1.44)	0.683

Model 1 was adjusted for age, gender, race/ethnicity, education level, and marital status; Model 2 was additionally adjusted for smoking, alcohol consumption, HEI-2015, physical activity, BMI, hypertension, hyperlipidemia and diabetes history, and CCI. Abbreviations: CVD, cardiovascular disease; BMI, body mass index; *HR*, hazard ratio; *CI*, confidence interval; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.

Supplementary Table 5. Sensitivity analysis of the associations between dietary supplements and all-cause, cancer, and non-cancer mortality among cancer survivors in different BMI (kg/m²) or frailty groups after Propensity Score Matching.

	Death, n	Weighted death (%)	Univariable model		Model 1		Model 2	
			HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
BMI < 25 km/m²								
All-cause mortality								
No	138	32.58	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	143	23.19	0.71(0.49,1.02)	0.061	0.46(0.33,0.62)	< 0.001	0.55(0.41,0.76)	< 0.001
Cancer mortality								
No	54	13.65	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	35	5.57	0.41(0.23,0.73)	0.002	0.37(0.21,0.67)	< 0.001	0.39(0.19,0.78)	0.008
Non-cancer mortality								
No	79	18.93	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	108	17.62	0.92(0.58,1.47)	0.725	0.50(0.33,0.76)	0.001	0.68(0.46,0.99)	0.042
25 ≤ BMI < 30 km/m²								
All-cause mortality								
No	145	25.76	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	162	26.55	1.16(0.90,1.49)	0.249	0.94(0.70,1.28)	0.712	1.33(0.96,1.84)	0.086
Cancer mortality								
No	62	10.91	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	40	8.53	0.86(0.55,1.33)	0.487	0.77(0.42,1.43)	0.408	1.05(0.53,2.09)	0.879
Non-cancer mortality								
No	83	14.85	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	122	18.03	1.39(0.99,1.94)	0.059	1.08(0.73,1.60)	0.696	1.48(0.94,2.33)	0.090
BMI ≥ 30 km/m²								
All-cause mortality								
No	130	20.75	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	73	15.84	0.88(0.59,1.31)	0.520	0.54(0.33,0.86)	0.010	0.58(0.36,0.93)	0.023
Cancer mortality								
No	52	7.87	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	27	5.76	0.82(0.46,1.48)	0.515	0.52(0.25,1.07)	0.075	0.68(0.30,1.56)	0.361
Non-cancer mortality								
No	78	12.88	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	46	10.09	0.91(0.56,1.47)	0.701	0.55(0.32,0.94)	0.028	0.54(0.33,0.89)	0.015
Frailty index ≤ 0.2 (Non-frail)								
All-cause mortality								
No	151	17.70	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	191	16.27	1.00(0.76,1.33)	0.976	0.76(0.57,1.02)	0.071	0.76(0.57,1.02)	0.818
Cancer mortality								
No	66	7.82	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	58	6.13	0.85(0.55,1.31)	0.459	0.76(0.46,1.26)	0.285	0.87(0.48,1.56)	0.239
Non-cancer mortality								
No	85	9.88	1[Reference]	/	1[Reference]	/	1[Reference]	/

Yes	133	10.14	1.13(0.76,1.66)	0.548	0.79(0.55,1.11)	0.175	1.11(0.74,1.67)	0.609
Frailty index > 0.2 (Frail)								
All-cause mortality								
No	257	37.99	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	187	36.23	1.13(0.84,1.52)	0.424	0.71(0.51,0.98)	0.037	0.78(0.56,1.09)	0.151
Cancer mortality								
No	102	14.65	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	44	8.19	0.62(0.39,0.99)	0.047	0.47(0.27,0.83)	0.009	0.57(0.29,1.09)	0.090
Non-cancer mortality								
No	155	23.34	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	143	28.05	1.47(1.06,2.02)	0.020	0.82(0.60,1.12)	0.211	0.88(0.65,1.19)	0.392

Model 1 was adjusted for age, gender, race/ethnicity, education level, and marital status;
Model 2 was additionally adjusted for smoking, alcohol consumption, HEI-2015, physical activity, frailty index, hypertension, hyperlipidemia and diabetes history, and CCI.
Abbreviations: CVD, cardiovascular disease; BMI, body mass index; *HR*, hazard ratio; *CI*, confidence interval; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.

Supplementary Table 6. Sensitivity analysis of the associations between dietary supplements and all-cause, cancer, and non-cancer mortality among cancer survivors in different BMI (kg/m²) or frailty groups after exclusion deaths with a follow-up period of fewer than two years.

	Death, n	Weighted death (%)	Univariable model		Model 1		Model 2	
			HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
BMI < 25 km/m²								
All-cause mortality								
No	97	28.38	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	224	22.92	0.76(0.54,1.07)	0.111	0.62(0.45,0.86)	0.005	0.63(0.45,0.87)	0.005
Cancer mortality								
No	31	9.10	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	55	5.51	0.59(0.34,1.03)	0.065	0.53(0.30,0.94)	0.031	0.46(0.24,0.86)	0.015
Non-cancer mortality								
No	66	19.28	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	169	17.41	0.84(0.54,1.30)	0.430	0.67(0.43,1.04)	0.071	0.72(0.46,1.12)	0.146
25 ≤ BMI < 30 km/m²								
All-cause mortality								
No	120	24.49	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	264	24.08	0.98(0.73,1.31)	0.886	0.91(0.69,1.19)	0.485	1.08(0.81,1.45)	0.592
Cancer mortality								
No	49	9.56	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	71	6.91	0.73(0.45,1.19)	0.207	0.68(0.42,1.12)	0.133	0.78(0.46,1.32)	0.351
Non-cancer mortality								
No	71	14.93	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	193	17.17	1.14(0.78,1.66)	0.502	1.06(0.74,1.51)	0.766	1.25(0.85,1.85)	0.255
BMI ≥ 30 km/m²								
All-cause mortality								
No	112	18.67	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	180	18.38	1.01(0.72,1.44)	0.935	0.93(0.62,1.37)	0.703	0.92(0.62,1.36)	0.685
Cancer mortality								
No	39	5.97	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	61	5.53	0.85(0.52,1.37)	0.498	0.80(0.49,1.32)	0.382	0.89(0.56,1.42)	0.623
Non-cancer mortality								
No	73	12.70	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	119	12.82	1.04(0.69,1.57)	0.851	0.92(0.56,1.52)	0.757	0.85(0.52,1.40)	0.528
Frailty index ≤ 0.2 (Non-frail)								
All-cause mortality								
No	141	18.02	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	305	15.82	0.84(0.62,1.12)	0.236	0.74(0.56,0.97)	0.028	0.74(0.56,0.97)	0.028
Cancer mortality								
No	58	7.53	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	92	5.19	0.68(0.46,1.01)	0.057	0.63(0.43,0.95)	0.025	0.59(0.39,0.89)	0.011
Non-cancer mortality								
No	83	10.50	1[Reference]	/	1[Reference]	/	1[Reference]	/

Yes	213	10.63	0.96(0.64,1.43)	0.829	0.84(0.59,1.20)	0.337	0.91(0.61,1.34)	0.627
Frailty index > 0.2 (Frail)								
All-cause mortality								
No	188	31.73	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	363	33.20	1.14(0.85,1.53)	0.369	1.00(0.74,1.35)	0.989	1.03(0.78,1.37)	0.838
Cancer mortality								
No	61	8.92	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	95	7.61	0.92(0.58,1.46)	0.729	0.90(0.57,1.42)	0.663	1.01(0.64,1.61)	0.953
Non-cancer mortality								
No	127	22.81	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	268	25.60	1.23(0.88,1.72)	0.222	1.04(0.72,1.50)	0.837	1.05(0.75,1.47)	0.793

Model 1 was adjusted for age, gender, race/ethnicity, education level, and marital status;
 Model 2 was additionally adjusted for smoking, alcohol consumption, HEI-2015, physical activity, frailty index, hypertension, hyperlipidemia and diabetes history, and CCI.
 Abbreviations: CVD, cardiovascular disease; BMI, body mass index; *HR*, hazard ratio; *CI*, confidence interval; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.

Supplementary Table 7. Sensitivity analysis of the associations between dietary supplements and all-cause, cancer, and non-cancer mortality among cancer survivors in different BMI (kg/m²) or frailty groups after the exclusion participants over 80 years of age.

	Death, n	Weighted death (%)	Univariable model		Model 1		Model 2	
			HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
BMI < 25 km/m²								
All-cause mortality								
No	117	30.80	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	217	22.26	0.65(0.47,0.91)	0.010	0.60(0.43,0.83)	0.002	0.65(0.47,0.89)	0.008
Cancer mortality								
No	47	12.63	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	66	6.15	0.46(0.27,0.80)	0.005	0.49(0.28,0.86)	0.013	0.53(0.30,0.95)	0.033
Non-cancer mortality								
No	70	18.17	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	151	16.11	0.79(0.51,1.21)	0.276	0.66(0.42,1.04)	0.073	0.74(0.48,1.15)	0.179
25 ≤ BMI < 30 km/m²								
All-cause mortality								
No	129	24.12	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	262	23.55	0.98(0.76,1.27)	0.896	0.90(0.71,1.15)	0.397	1.09(0.84,1.42)	0.500
Cancer mortality								
No	58	10.70	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	84	7.92	0.75(0.52,1.09)	0.136	0.73(0.49,1.08)	0.118	0.85(0.55,1.29)	0.435
Non-cancer mortality								
No	71	13.42	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	178	15.63	1.16(0.79,1.72)	0.444	1.04(0.72,1.50)	0.826	1.28(0.87,1.90)	0.216
BMI ≥ 30 km/m²								
All-cause mortality								
No	123	19.97	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	199	18.19	0.97(0.69,1.38)	0.880	0.91(0.62,1.33)	0.623	0.91(0.63,1.31)	0.614
Cancer mortality								
No	50	7.51	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	74	6.12	0.87(0.53,1.42)	0.573	0.85(0.51,1.43)	0.548	0.93(0.57,1.50)	0.760
Non-cancer mortality								
No	73	12.45	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	125	12.08	1.04(0.70,1.55)	0.855	0.94(0.59,1.51)	0.805	0.88(0.55,1.42)	0.613
Frailty index ≤ 0.2 (Non-frail)								
All-cause mortality								
No	134	16.65	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	274	14.53	0.83(0.62,1.12)	0.229	0.75(0.58,0.97)	0.028	0.76(0.59,0.98)	0.035
Cancer mortality								
No	60	7.37	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	91	5.19	0.69(0.46,1.03)	0.071	0.64(0.43,0.96)	0.031	0.61(0.41,0.92)	0.020
Non-cancer mortality								
No	74	9.28	1[Reference]	/	1[Reference]	/	1[Reference]	/

Yes	183	9.33	0.95(0.62,1.45)	0.813	0.83(0.57,1.20)	0.325	0.89(0.60,1.33)	0.572
Frailty index > 0.2 (Frail)								
All-cause mortality								
No	235	36.25	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	404	33.52	0.61(0.41,0.92)	0.971	0.89(0.67,1.19)	0.436	0.94(0.72,1.23)	0.672
Cancer mortality								
No	95	14.11	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	133	9.63	0.72(0.48,1.09)	0.118	0.72(0.47,1.10)	0.128	0.80(0.53,1.21)	0.290
Non-cancer mortality								
No	140	22.13	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	271	23.89	1.19(0.86,1.63)	0.289	1.00(0.72,1.39)	0.998	1.04(0.76,1.42)	0.812

Model 1 was adjusted for age, gender, race/ethnicity, education level, and marital status;
Model 2 was additionally adjusted for smoking, alcohol consumption, HEI-2015, physical activity, frailty index, hypertension, hyperlipidemia and diabetes history, and CCI.
Abbreviations: CVD, cardiovascular disease; BMI, body mass index; *HR*, hazard ratio; *CI*, confidence interval; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.

Supplementary Table 8. Sensitivity analysis of the associations between dietary supplements and all-cause, cancer, and non-cancer mortality among cancer survivors in different BMI (kg/m²) or frailty groups without complex survey design.

Frailty groups without complex survey design.								
	Death, n	Death, %	Univariable model		Model 1		Model 2	
			HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
BMI < 25 km/m²								
All-cause mortality								
No	133	41.43	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	274	35.13	0.79(0.64,0.97)	0.023	0.70(0.57,0.88)	0.002	0.70(0.56,0.87)	0.002
Cancer mortality								
No	54	16.82	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	79	10.13	0.57(0.40,0.81)	0.001	0.59(0.41,0.84)	0.004	0.59(0.40,0.85)	0.005
Non-cancer mortality								
No	79	24.61	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	195	25.00	0.93(0.72,1.21)	0.610	0.77(0.59,1.02)	0.066	0.79(0.60,1.05)	0.100
25 ≤ BMI < 30 km/m²								
All-cause mortality								
No	145	33.72	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	313	31.94	0.98(0.80,1.19)	0.819	0.85(0.69,1.04)	0.119	0.94(0.76,1.15)	0.533
Cancer mortality								
No	62	14.42	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	91	9.29	0.67(0.48,0.92)	0.014	0.65(0.47,0.91)	0.011	0.71(0.51,1.00)	0.050
Non-cancer mortality								
No	83	19.30	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	222	22.65	1.21(0.94,1.56)	0.141	0.99(0.77,1.29)	0.957	1.09(0.84,1.42)	0.511
BMI ≥ 30 km/m²								
All-cause mortality								
No	130	27.03	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	216	22.98	0.90(0.73,1.12)	0.355	0.80(0.64,1.01)	0.057	0.89(0.71,1.13)	0.353
Cancer mortality								
No	52	12.06	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	78	8.30	0.81(0.57,1.16)	0.251	0.78(0.54,1.14)	0.199	0.85(0.59,1.25)	0.416
Non-cancer mortality								
No	78	16.22	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	138	14.68	0.96(0.73,1.27)	0.782	0.81(0.61,1.09)	0.158	0.92(0.68,1.25)	0.599
Frailty index ≤ 0.2 (Non-frail)								
All-cause mortality								
No	151	24.51	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	332	21.71	0.86(0.71,1.04)	0.125	0.76(0.62,0.93)	0.007	0.76(0.62,0.93)	0.008
Cancer mortality								
No	66	10.71	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	102	6.67	0.61(0.45,0.83)	0.002	0.57(0.41,0.79)	< 0.001	0.57(0.41,0.79)	< 0.001
Non-cancer mortality								
No	85	13.80	1[Reference]	/	1[Reference]	/	1[Reference]	/

Yes	230	15.04	1.05(0.82,1.35)	0.688	0.91(0.70,1.17)	0.453	0.93(0.72,1.20)	0.571
Frailty index > 0.2 (Frail)								
All-cause mortality								
No	257	41.72	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	471	40.22	1.07(0.92,1.24)	0.410	0.88(0.75,1.03)	0.105	0.93(0.79,1.09)	0.361
Cancer mortality								
No	102	16.56	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	146	12.47	0.82(0.63,1.05)	0.115	0.78(0.60,1.01)	0.058	0.82(0.62,1.06)	0.131
Non-cancer mortality								
No	155	25.16	1[Reference]	/	1[Reference]	/	1[Reference]	/
Yes	325	27.75	1.23(1.02,1.49)	0.032	0.93(0.76,1.13)	0.476	0.99(0.81,1.21)	0.913

Model 1 was adjusted for age, gender, race/ethnicity, education level, and marital status;
Model 2 was additionally adjusted for smoking, alcohol consumption, HEI-2015, physical activity, frailty index, hypertension, hyperlipidemia and diabetes history, and CCI.
Abbreviations: CVD, cardiovascular disease; BMI, body mass index; *HR*, hazard ratio; *CI*, confidence interval; HEI, Healthy Eating Index; CCI, Charlson Comorbidity Index.