Diagram

Description automatically generated

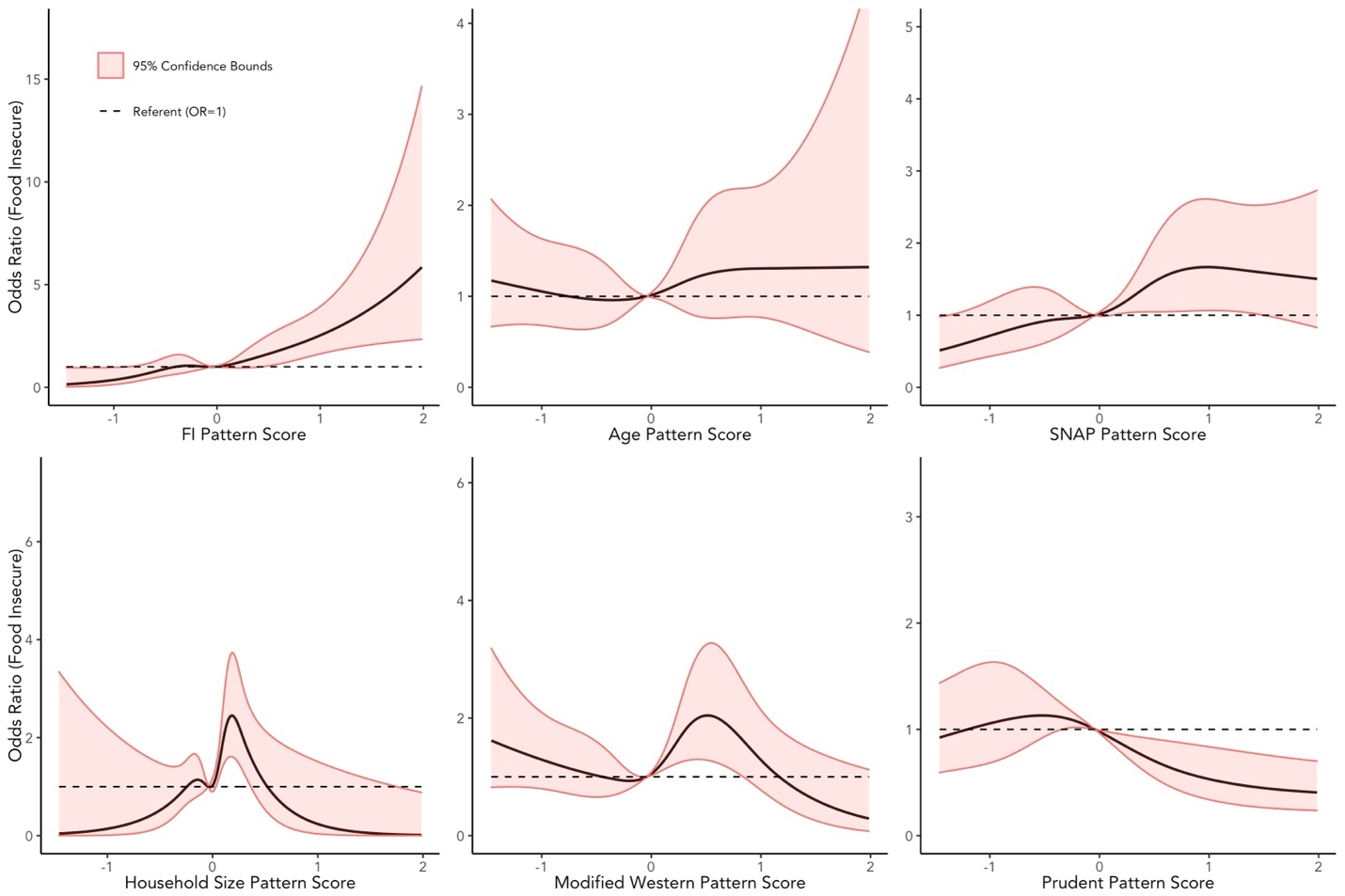
**Figure 1**. Study sample flow chart detailing the sample selection process and the analytical strategy. Subsamples A, B, and C are periodically referred to in the text.

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| --- | --- | --- | --- | --- |
| Characteristic | Total Survivors (*n* = 3,317) | Food Insecure  (*n* = 433) | Food Secure  (*n* = 2,884) | *p* |
| Age |  |  |  | < 0.01 |
| Mean (SD) | 62.6 (14.8) | 50.8 (15.7) | 64.1 (14) |  |
| Sex | | | | < 0.01 |
| Male | 1527 (40.9) | 143 (24.5) | 1384 (42.9) |  |
| Female | 1790 (59.1) | 290 (75.5) | 1500 (57.1) |  |
| Race/Ethnicity | | | | < 0.01 |
| Mexican American | 235 (2.7) | 67 (9.2) | 168 (1.9) |  |
| Other Hispanic | 183 (2.6) | 48 (5.8) | 135 (2.2) |  |
| Non-Hispanic White | 2219 (84.3) | 208 (68.3) | 2011 (86.3) |  |
| Non-Hispanic Black | 534 (6.9) | 88 (11.2) | 446 (6.4) |  |
| Other/Multiracial | 146 (3.5) | 22 (5.5) | 124 (3.2) |  |
| Education Attained | |  |  | < 0.01 |
| ≤ High School | 1577 (36.8) | 279 (59.3) | 1298 (34.1) |  |
| ≥ Some College | 1737 (63.2) | 152 (40.7) | 1585 (65.9) |  |
| FIPR | | | | < 0.01 |
| ≥ 1.3 | 2279 (82.2) | 128 (39.1) | 2151 (87.6) |  |
| < 1.3 | 800 (17.8) | 288 (60.9) | 512 (12.4) |  |
| Household Size |  |  |  | < 0.01 |
| < 5 Persons | 3027 (92.3) | 345 (79.3) | 2682 (93.9) |  |
| ≥ 5 Persons | 290 (7.7) | 88 (20.7) | 202 (6.1) |  |
| BMI (kg/m2) | | | | 0.23 |
| Mean (SD) | 29.2 (6.6) | 29.7 (7.2) | 29.1 (6.5) |  |
| Weekly MET Minutes |  |  |  | <0.01 |
| Mean (SD) | 2314.2 (4475.2) | 4641.1 (7771) | 2034.9 (3804.1) |  |
| Daily Caloric Intake (kcal) | | | | <0.01 |
| Mean (SD) | 1894.6 (687) | 1711.1 (740.2) | 1917 (677.0) |  |
| CCI | | | | < 0.01 |
| Mean (SD) | 3.0 (1.4) | 3.3 (1.8) | 3.0 (1.4) |  |
| SNAP Assistance | |  |  | < 0.01 |
| No | 2839 (88.6) | 220 (49.9) | 2619 (93.3) |  |
| Yes | 478 (11.4) | 213 (50.1) | 265 (6.7) |  |
| Cancer Site | | | | < 0.01 |
| Breast | 563 (17.2) | 58 (10.2) | 505 (18.0) |  |
| Gastrointestinal | 321 (7.7) | 45 (11.3) | 276 (7.3) |  |
| Genitourinary | 145 (3.7) | 15 (3.7) | 130 (3.7) |  |
| Gynecological | 522 (17.8) | 132 (38.1) | 390 (15.3) |  |
| Male Reproductive | 620 (13.8) | 50 (6.0) | 570 (14.7) |  |
| Melanoma | 240 (9.3) | 15 (2.0) | 225 (10.2) |  |
| Other | 592 (19.1) | 99 (23.1) | 493 (18.6) |  |
| Years Since Diagnosis | | | | 0.53 |
| < 2 years | 817 (22.0) | 113 (21.4) | 704 (22) |  |
| ≥ 2 and < 6 years | 1991 (64.4) | 257 (67.4) | 1734 (64.1) |  |
| ≥ 6 years | 497 (13.6) | 60 (11.2) | 437 (13.9) |  |
| Smoking Status | |  |  | < 0.01 |
| Current | 517 (16.4) | 142 (37.8) | 375 (13.8) |  |
| Former | 1347 (38.9) | 120 (26.8) | 1227 (40.4) |  |
| Never | 1451 (44.7) | 170 (35.4) | 1281 (45.8) |  |
| Alcohol Use |  |  |  | 0.13 |
| Heavy | 323 (12.8) | 29 (6.6) | 294 (13.6) |  |
| Moderate | 498 (16.1) | 48 (15.0) | 450 (16.2) |  |
| None-drinking | 2496 (71.1) | 356 (78.5) | 2140 (70.2) |  |
| **Table 1**. Sociodemographic and behavioral characteristics of the cancer survivor study sample (subsample A in Figure 1), stratified by food security status. Frequencies are presented with percentages in parentheses.  Percentages may not add to 100% given rounding  *p* values are from chi-square tests for categorical variables and t-tests for continuous variables | | | | |

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|  | **Pattern** | **Food Insecurity (FI)†** | **Age†** | **Food Assistance (SNAP) †** | **Household Size†** | **Modified Western‡** | **Prudent‡** |
| **Food Groups** | |
| Processed Meats | | -0.05 | -0.01 | 0.04 | 0.030 | 0.12 | -0.22 |
| Meats | | 0.22 | -0.03 | 0.08 | 0.00 | 0.07 | -0.17 |
| Poultry | | 0.00 | -0.26 | -0.08 | 0.20 | -0.03 | 0.35 |
| Seafood—High n-3 | | -0.16 | 0.05 | -0.11 | -0.06 | -0.04 | 0.30 |
| Seafood—Low n-3 | | -0.17 | 0.08 | -0.06 | -0.16 | -0.04 | 0.07 |
| Eggs | | 0.07 | 0.11 | 0.00 | 0.15 | 0.24 | 0.07 |
| Solid Fats | | 0.12 | 0.04 | 0.22 | -0.12 | 0.21 | -0.46 |
| Oils | | -0.26 | 0.04 | -0.24 | 0.09 | 0.34 | 0.12 |
| Milk | | -0.10 | 0.37 | 0.00 | -0.19 | -0.06 | 0.12 |
| Yogurt | | -0.09 | 0.05 | -0.10 | -0.32 | 0.07 | 0.35 |
| Cheese | | -0.06 | -0.39 | 0.05 | -0.19 | 0.34 | -0.28 |
| Alcohol | | -0.19 | -0.27 | -0.34 | -0.09 | -0.36 | -0.16 |
| Fruit—Other | | -0.23 | 0.41 | -0.24 | -0.33 | 0.03 | 0.49 |
| Fruit—Citrus, melons, and berries | | -0.20 | 0.18 | -0.19 | -0.36 | 0.04 | 0.50 |
| Tomatoes | | -0.21 | 0.04 | -0.17 | -0.36 | 0.48 | 0.14 |
| Dark-Green Vegetables | | -0.21 | -0.19 | -0.26 | -0.22 | 0.26 | 0.53 |
| Dark-Yellow Vegetables | | -0.16 | 0.10 | -0.34 | -0.06 | 0.14 | 0.45 |
| Other Vegetables | | -0.50 | 0.17 | -0.65 | -0.48 | 0.46 | 0.45 |
| Potatoes | | 0.41 | 0.25 | 0.06 | 0.05 | 0.16 | -0.04 |
| Other Starchy Vegetables | | -0.03 | 0.16 | -0.11 | -0.15 | -0.12 | 0.17 |
| Legumes | | 0.01 | -0.24 | 0.21 | 0.23 | 0.04 | -0.08 |
| Soy | | -0.08 | -0.11 | -0.20 | 0.22 | 0.08 | 0.21 |
| Refined Grains | | -0.13 | -0.12 | 0.17 | 0.13 | 0.11 | -0.34 |
| Whole Grains | | -0.20 | 0.47 | -0.25 | -0.27 | -0.05 | 0.38 |
| Nuts | | -0.28 | 0.10 | -0.31 | -0.02 | 0.18 | 0.19 |
| Added Sugars | | 0.76 | -0.28 | 0.64 | 0.48 | -0.32 | -0.27 |
| FI | | -- |  |  |  |  |  |
| Age | | -0.28 | -- |  |  |  |  |
| SNAP | | 0.80 | -0.37 | -- |  |  |  |
| Household Size | | 0.63 | -0.50 | 0.62 | -- |  |  |
| Modified Western | | -0.26 | 0.09 | -0.29 | -0.31 | -- |  |
| Prudent | | -0.40 | 0.35 | -0.56 | -0.41 | 0.16 | -- |
| **Table 2.** Pearson correlation coefficients matrix amongst each of the derived patterns (extracted using either penalized logistic regression or principal components analysis) and the food groups used in the analysis. This analysis was performed on subsample A (Figure 1), an analytical subsample of food insecure cancer survivors (*n* = 3,317).  **†** Dietary pattern obtained using penalized logistic regression.  **‡** Dietary patterns obtained using principal components analysis (PCA). | | | | | | | |

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|  | | | | **Food Insecurity (FI) Pattern†** | | | | | **Age Pattern†** | | | | **Food Assistance (SNAP) Pattern†** | | | | **Household Size Pattern†** | | | | **Modified Western‡** | | | | **Prudent‡** | | | | |
|  | | | | **M1**  (*n* = 1658) | | | **M2**  (*n* = 1659) | | **M1**  (*n* = 1658) | | **M2**  (*n* = 1659) | | **M1**  (*n* = 1658) | | **M2**  (*n* = 1659) | | **M1**  (*n* = 1658) | | **M2**  (*n* = 1659) | | **M1**  (*n* = 1658) | | **M2**  (*n* = 1659) | | **M1**  (*n* = 1658) | | | **M2**  (*n* = 1659) | |
| Age | | | |  | | | \*\* | |  | | \*\* | |  | | \*\* | |  | | \*\* | |  | |  | |  | | \*\* | | |
| Mean (SD) | | | | 64.1 (13.5) | | | 61.1 (15.9) | | 58.6 (14.9) | | 67.4 (13.1) | | 64.5 (13.3) | | 60.5 (16.0) | | 65.2 (13.3) | | 59.8 (15.8) | | 63 (15.1) | | 62.3 (14.5) | | 60.3 (15.4) | | 65.1 (13.6) | | |
| Sex | | | |  | | |  | |  | |  | |  | |  | |  | |  | |  | | \* | |  | | \*\* | | |
| Male | | | | 752 (41.0) | | | 775 (40.8) | | 741 (41.1) | | 786 (40.6) | | 762 (41.1) | | 765 (40.6) | | 741 (38.9) | | 786 (43.0) | | 821 (44.1) | | 706 (38.2) | | 836 (46.9) | | 691 (34.4) | | |
| Female | | | | 906 (59.0) | | | 884 (59.2) | | 917 (58.9) | | 873 (59.4) | | 896 (58.9) | | 894 (59.4) | | 917 (61.1) | | 873 (57.0) | | 837 (55.9) | | 953 (61.8) | | 822 (53.1) | | 968 (65.6) | | |
| Race/Ethnicity | | |  | | | | \* | |  | | \*\* | |  | | \*\* | |  | | \*\* | |  | | \*\* | |  | | \* | | |
| Minority | | | | 513 (14.2) | | | 585 (17.2) | | 663 (18.2) | | 435 (12.6) | | 474 (12.8) | | 624 (18.8) | | 428 (11.8) | | 670 (19.8) | | 639 (19.3) | | 459 (12.6) | | 528 (14.2) | | 570 (17.3) | | |
| White | | | | 1145 (85.8) | | | 1074 (82.8) | | 995 (81.8) | | 1224 (87.4) | | 1184 (87.2) | | 1035 (81.2) | | 1230 (88.2) | | 989 (80.2) | | 1019 (80.7) | | 1200 (87.4) | | 1130 (85.8) | | 1089 (82.7) | | |
| Education | | | |  | | | \*\* | |  | | \* | |  | | \*\* | |  | | \*\* | |  | |  | |  | | \*\* | | |
| ≤ HS | | | | 691 (31.5) | | | 886 (42.6) | | 752 (34.4) | | 825 (39.6) | | 700 (30.3) | | 877 (43.9) | | 722 (33.3) | | 855 (40.6) | | 800 (37.6) | | 777 (36.2) | | 867 (40.2) | | 710 (33.2) | | |
| ≥ Some College | | | | 966 (68.5) | | | 771 (57.4) | | 905 (65.6) | | 832 (60.4) | | 957 (69.7) | | 780 (56.1) | | 934 (66.7) | | 803 (59.4) | | 856 (62.4) | | 881 (63.8) | | 791 (59.8) | | 946 (66.8) | | |
| FIPR | |  | | | | | \*\* | |  | |  | |  | | \*\* | |  | | \*\* | |  | | \*\* | |  | | \* | | |
| ≥ 1.3 | | | | 1214 (86.9) | | | 1065 (77.2) | | 1104 (81.4) | | 1175 (83.2) | | 1232 (87.5) | | 1047 (76.4) | | 1189 (84.9) | | 1090 (79.4) | | 1100 (79.2) | | 1179 (84.8) | | 1089 (80.2) | | 1190 (84.5) | | |
| < 1.3 | | | | 327 (13.1) | | | 473 (22.8) | | 443 (18.6) | | 357 (16.8) | | 307 (12.5) | | 493 (23.6) | | 342 (15.1) | | 458 (20.6) | | 437 (20.8) | | 363 (15.2) | | 462 (19.8) | | 338 (15.5) | | |
| Household size | | | |  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | |
| < 5 Persons | | | | 1547 (94.5) | | | 1480 (90.0) | | 1460 (90.0) | | 1567 (95.1) | | 1563 (95.4) | | 1464 (89.0) | | 1557 (96.6) | | 1470 (87.7) | | 1495 (91.8) | | 1532 (92.8) | | 1482 (90.4) | | 1545 (94.4) | | |
| ≥ 5 Persons | | | | 111 (5.5) | | | 179 (10.0) | | 198 (10.0) | | 92 (4.9) | | 95 (4.6) | | 195 (11.0) | | 101 (3.4) | | 189 (12.3) | | 163 (8.2) | | 127 (7.2) | | 176 (9.6) | | 114 (5.6) | | |
| BMI | | | |  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | |
| Mean (SD) | | | | 29.3 (6.6) | | | 29 (6.6) | | 29.3 (6.8) | | 29 (6.4) | | 29 (6.3) | | 29.4 (6.9) | | 29.2 (6.3) | | 29.1 (6.9) | | 28.6 (6.2) | | 29.7 (6.9) | | 29.7 (6.9) | | 28.6 (6.2) | | |
| Weekly MET Minutes | | | |  | | |  | |  | | \* | |  | |  | |  | |  | |  | |  | |  | |  | | |
| Mean (SD) | | | | 2185.6 (3865.4) | | | 2454.4 (5054.7) | | 2611.5 (4911.5) | | 1959  (3862.2) | | 2117.8 (3584.0) | | 2529.2 (5274.0) | | 2056.1 (3644.8) | | 2593.5 (5214.2) | | 2313.3 (4364.1) | | 2314.9 (4567.9) | | 2504.3 (5077.2) | | 2108.2 (3705.2) | | |
| Daily Caloric Intake | | | |  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | |
| Mean (SD) | | | | 1836.2 (660.8) | | | 1958.3 (709.2) | | 1938.4 (696.4) | | 1842.8 (672.3) | | 1842.1 (655.0) | | 1952.2 (716.2) | | 1848 (655.0) | | 1945.1 (716.8) | | 1898.6 (705.1) | | 1891.3 (671.6) | | 2041.2 (746.9) | | 1736.6 (575.7) | | |
| CCI | | | |  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | |
| Mean (SD) | | | | 3.1 (1.4) | | | 3.0 (1.4) | | 2.9 (1.3) | | 3.1 (1.5) | | 3.0 (1.4) | | 3.0 (1.4) | | 3.0 (1.4) | | 3.0 (1.4) | | 3.0 (1.4) | | 3.0 (1.4) | | 3.0 (1.4) | | 3.0 (1.4) | | |
| Food Security |  | | | |  | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | |
| Food Secure | 1482 (93.7) | | | | 1357 (83.1) | | | 1351 (85.4) | | 1488 (92.5) | | 1512 (95.0) | | 1327 (81.7) | | 1476 (92.9) | | 1363 (84.0) | | 1379 (86.5) | | 1460 (90.5) | | 1352 (84.7) | | 1487 (92.9) | | |
| Food Insecure | 176 (6.3) | | | | 302 (16.9) | | | 307 (14.6) | | 171 (7.5) | | 146 (5.0) | | 332 (18.3) | | 182 (7.1) | | 296 (16.0) | | 279 (13.5) | | 199 (9.5) | | 306 (15.3) | | 172 (7.1) | | |
| SNAP Assistance | | | | | | |  | |  | | \* | |  | |  | |  | |  | |  | |  | |  | |  | | |
| No | | 1482 (93.7) | | | | 1357 (83.1) | | | 1351 (85.4) | | 1488 (92.5) | | 1512 (95.0) | | 1327 (81.7) | | 1476 (92.9) | | 1363 (84.0) | | 1379 (86.5) | | 1460 (90.5) | | 1352 (84.7) | | 1487 (92.9) | | |
| Yes | | 176 (6.3) | | | | 302 (16.9) | | | 307 (14.6) | | 171 (7.5) | | 146 (5.0) | | 332 (18.3) | | 182 (7.1) | | 296 (16.0) | | 279 (13.5) | | 199 (9.5) | | 306 (15.3) | | 172 (7.1) | | |
| Smoking Status | | | | | | |  | |  | |  | |  | | \* | |  | |  | |  | |  | |  | | \*\* | | |
| Current | | | | 188 (11.4) | | | 329 (21.9) | | 344 (20.6) | | 173 (11.4) | | 191 (11.4) | | 326 (21.9) | | 179 (11.3) | | 338 (21.9) | | 284 (18.3) | | 233 (14.8) | | 393 (24.5) | | 124 (7.6) | | |
| Former | | | | 724 (42.3) | | | 623 (35.2) | | 628 (36.3) | | 719 (42.0) | | 712 (42.6) | | 635 (34.8) | | 727 (43.0) | | 620 (34.4) | | 664 (38.6) | | 683 (39.2) | | 670 (37.8) | | 677 (40.1) | | |
| Never | | | | 745 (46.3) | | | 706 (43.0) | | 685 (43.1) | | 766 (46.6) | | 754 (46.0) | | 697 (43.3) | | 750 (45.7) | | 701 (43.6) | | 709 (43.2) | | 742 (46.0) | | 594 (37.7) | | 857 (52.2) | | |
| Alcohol Use | | | |  | | |  | |  | | \* | |  | |  | |  | |  | |  | |  | |  | |  | | |
| Heavy | | | | 214 (16.3) | | | 109 (9.1) | | 242 (18.9) | | 81 (5.6) | | 265 (20.7) | | 58 (4.2) | | 206 (16.1) | | 117 (9.3) | | 227 (19.9) | | 96 (6.9) | | 207 (15.2) | | 116 (10.2) | | |
| Moderate | | | | 272 (16.3) | | | 226 (15.9) | | 264 (17.2) | | 234 (14.8) | | 294 (17.3) | | 204 (14.8) | | 266 (15.0) | | 232 (17.3) | | 276 (17.4) | | 222 (15.0) | | 250 (16.9) | | 248 (15.3) | | |
| Non-drinking | | | | 1172 (67.5) | | | 1324 (75.0) | | 1152 (63.9) | | 1344 (79.6) | | 1099 (62.0) | | 1397 (81.0) | | 1186 (68.9) | | 1310 (73.5) | | 1155 (62.7) | | 1341 (78.1) | | 1201 (67.9) | | 1295 (74.5) | | |
| **Table 3.** Derived dietary patterns and their distributions across study covariates in cancer survivors (subsample A in Figure 1) included in the survival analysis (*n*  = 3,317).  M1 refers to the lower median while M2 refers to the upper median of the data.  **†** Dietary pattern obtained using penalized logistic regression.  **‡** Dietary pattern obtained using principal components analysis (PCA). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dietary Patterna | Q1 | Q2 | Q3 | Q4 | Q5 | *p*Q5-Q1 | *p*trend | HRbcontinuous | *p*c*quadratic* |
| Food Insecurity**†** | 1.00 | 1.09 (0.58-2.02) | 1.18 (0.57-2.45) | 1.91 (1.04-3.53)\* | 2.42 (1.21-4.82)\* | 0.01\* | <0.01\*\* | 1.50 (1.19-1.9)\*\* | 0.11 |
| Age**†** | 1.00 | 1.91 (1.12-3.27)\* | 1.41 (0.67-2.93) | 1.14 (0.49-2.69) | 1.82 (0.93-3.56) | 0.08 | 0.28 | 1.05 (0.87-1.27) | 0.57 |
| Food Assistance (SNAP)**†** | 1.00 | 1.38 (0.65-2.93) | 1.44 (0.77-2.71) | 2.54 (1.22-5.30)\* | 2.23 (1.26-3.94)\*\* | <0.01\*\* | <0.01\*\* | 1.37 (1.12-1.68)\*\* | 0.46 |
| Household Size**†** | 1.00 | 1.63 (0.78-3.43) | 1.00 (0.52-1.92) | 2.77 (1.46-5.25)\*\* | 2.02 (0.98-4.18) | 0.06 | 0.01\* | 1.27 (1.04-1.54)\* | 0.36 |
| Modified Western**‡** | 1.00 | 0.86 (0.48-1.51) | 0.69 (0.33-1.45) | 1.46 (0.81-2.64) | 1.33 (0.66-2.67) | 0.42 | 0.16 | 1.05 (0.88-1.25) | 0.70 |
| Prudent**‡** | 1.00 | 0.81 (0.37-1.78) | 1.09 (0.53-2.26) | 0.54 (0.26-1.10) | 0.40 (0.20-0.80)\*\* | <0.01\*\* | <0.01\*\* | 0.76 (0.63-0.92)\*\* | 0.27 |
| **Table 4.** Odds ratios† and 95% confidence intervals for the relationship between the dietary patterns scores and the odds of being food insecure. There were 3,317 cancer survivors (subsample A in Figure 1) that contributed to this analysis.  \*\*  *p* < 0.01  \* *p* < 0.05  a All models adjusted for age, sex, race/ethnicity, family income-to-poverty ratio, highest level of education attained, household size, SNAP participation status, BMI, estimated caloric intake, weekly MET minutes, primary cancer site, smoking status, and the Charlson Comorbidity Index score and were weighted according to guidelines provided by the NCHS.  b Hazard ratio (HR) corresponding to a standard deviation increase in the diet pattern score.  c Wald test *p*-value for a quadratic polynomial term.  **†** Dietary pattern obtained using penalized logistic regression.  **‡** Dietary pattern obtained using principal components analysis (PCA). | | | | | | | | | |



**Figure 2**. Adjusted restricted cubic spline curves demonstrating the relationships between dietary pattern scores and the odds of being food insecure in the subsample of cancer survivors (subsample A in Figure 1). These models used five knots to model each dietary pattern score and adjusted for age, sex, race/ethnicity, income to poverty ratio, highest level of education attained, household size, SNAP participation status, BMI, estimated caloric intake, weekly MET minutes, smoking status, and the Charlson Comorbidity Index (CCI) score and were weighted using normalized weights. The hazard at the median of each dietary pattern score was employed as the referent.

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| --- | --- |
| **Food Group**a | **Description** |
| Processed Meats | *Oz cooked lean meat from franks, sausages, luncheon meats* |
| Meats | *Oz cooked lean meat from beef, pork, veal, lamb, organ meats, and game* |
| Poultry | *Oz cooked lean meat from chicken, poultry, and other poultry* |
| Seafood—High n-3 | *Oz cooked lean meat from fish, other seafood high in Omega-3* |
| Seafood—Low n-3 | *Oz cooked lean meat from fish, other seafood low in Omega-3* |
| Eggs | *Oz equivalents of eggs* |
| Solid Fats | *Grams of discretionary Solid fat* |
| Oils | *Grams of discretionary Oil* |
| Milk | *Number of milk cup equivalents* |
| Yogurt | *Number of yogurt cup equivalents* |
| Cheese | *Number of cheese cup equivalents* |
| Alcohol | *Total drinks of alcohol* |
| Fruit—Other | *Number of other fruit cup equivalents* |
| Fruit—Citrus, melons, and berries | *Number of citrus, melon, berry cup equivalents* |
| Tomatoes | *Number of tomato cup equivalents* |
| Dark-Green Vegetables | *Number of dark-green vegetable cup equivalents* |
| Dark-Yellow Vegetables | *Number of orange vegetable cup equivalents* |
| Other Vegetables | *Number of other vegetable cup equivalents* |
| Potatoes | *Number of white potato cup equivalents* |
| Other Starchy Vegetables | *Number of other starchy vegetable cup equivalents* |
| Legumes | *Number of cooked dry beans and peas cup equivalents* |
| Soy | *Oz equivalents of soy products* |
| Refined Grains | *Number of non-whole grain ounce equivalents* |
| Whole Grains | *Number of whole grain ounce equivalents* |
| Nuts | *Oz equivalents of nuts and seeds* |
| Added Sugars | *Teaspoon equivalents of added sugars* |
| **Supplementary Table 1**. Food grouping scheme used in the present analysis.  a Adopted from the FPED/MPED Database | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Pattern** | **Food Insecurity (FI)†** | **Age†** | **Food Assistance (SNAP) †** | **Household Size†** | **Modified Western‡** | **Prudent‡** |
| **Food Groups** | |
| Processed Meats | | 0.00 | 0.00 | 0.00 | 0.01 | 0.17 | -0.12 |
| Meats | | 0.15 | -0.05 | 0.08 | 0.01 | 0.24 | -0.13 |
| Poultry | | 0.11 | -0.18 | 0.05 | 0.05 | 0.14 | 0.26 |
| Seafood—High n-3 | | 0.00 | 0.00 | 0.03 | 0.00 | 0.01 | 0.13 |
| Seafood—Low n-3 | | 0.00 | 0.02 | 0.05 | -0.02 | 0.07 | -0.03 |
| Eggs | | 0.10 | 0.03 | 0.07 | 0.04 | 0.20 | 0.05 |
| Solid Fats | | 0.00 | 0.16 | -0.08 | -0.05 | 0.39 | -0.19 |
| Oils | | 0.00 | 0.02 | 0.00 | 0.02 | 0.34 | -0.05 |
| Milk | | 0.00 | 0.12 | 0.00 | -0.02 | 0.20 | 0.03 |
| Yogurt | | 0.00 | 0.01 | 0.00 | -0.04 | 0.09 | 0.21 |
| Cheese | | 0.05 | -0.25 | 0.10 | -0.02 | 0.25 | -0.18 |
| Alcohol | | -0.01 | -0.09 | -0.25 | -0.01 | 0.05 | -0.20 |
| Fruit—Other | | 0.00 | 0.21 | -0.06 | -0.04 | 0.12 | 0.30 |
| Fruit—Citrus, melons, and berries | | 0.00 | 0.06 | 0.00 | -0.03 | 0.07 | 0.40 |
| Tomatoes | | 0.00 | 0.01 | 0.00 | -0.04 | 0.27 | -0.05 |
| Dark-Green Vegetables | | 0.00 | -0.17 | 0.00 | -0.01 | 0.12 | 0.33 |
| Dark-Yellow Vegetables | | 0.00 | 0.00 | -0.16 | 0.01 | 0.12 | 0.32 |
| Other Vegetables | | -0.19 | 0.11 | -0.49 | -0.06 | 0.22 | 0.27 |
| Potatoes | | 0.21 | 0.14 | 0.00 | 0.00 | 0.23 | 0.01 |
| Other Starchy Vegetables | | 0.00 | 0.10 | -0.08 | -0.03 | 0.03 | 0.17 |
| Legumes | | 0.06 | -0.19 | 0.25 | 0.05 | 0.11 | -0.15 |
| Soy | | 0.00 | -0.05 | -0.12 | 0.04 | 0.12 | 0.10 |
| Refined Grains | | 0.00 | 0.00 | 0.00 | 0.02 | 0.34 | -0.16 |
| Whole Grains | | 0.00 | 0.26 | -0.15 | -0.04 | 0.14 | 0.26 |
| Nuts | | -0.03 | 0.05 | -0.17 | 0.00 | 0.16 | -0.01 |
| Added Sugars | | 0.41 | -0.17 | 0.38 | 0.07 | 0.24 | -0.18 |
| **Supplementary Table 2.** Model coefficients or component loadings for each of the derived patterns (extracted using either penalized logistic regression or principal components analysis) and the food groups used in the analysis. This analysis was performed on subsample A (Figure 1), an analytical subsample of food insecure cancer survivors (*n* = 3,317).  **†** Dietary pattern obtained using penalized logistic regression.  **‡** Dietary patterns obtained using principal components analysis (PCA). | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dietary Patterna | | Group | Q1 | Q2 | Q3 | Q4 | Q5 | *p*Q5-Q1 | *p*trend | ORbcontinuous | *p*c*quadratic* | |
| Food Insecurity**†** | | Male | 1.00 | 0.65 (0.20-2.11) | 0.95 (0.34-2.66) | 1.87 (0.70-4.99) | 1.46 (0.44-4.87) | 0.53 | 0.23 | 1.32 (0.89-1.96) | 0.23 | |
| Age**†** | | Male | 1.00 | 1.04 (0.34-3.15) | 1.52 (0.51-4.56) | 1.37 (0.33-5.60) | 2.68 (0.82-8.72) | 0.10 | 0.13 | 1.31 (0.95-1.81) | 0.96 | |
| Food Assistance (SNAP)**†** | | Male | 1.00 | 0.48 (0.15-1.53) | 0.56 (0.22-1.42) | 0.82 (0.29-2.34) | 1.09 (0.33-3.59) | 0.88 | 0.59 | 1.17 (0.77-1.78) | 0.84 | |
| Household Size**†** | | Male | 1.00 | 0.76 (0.26-2.26) | 0.51 (0.14-1.82) | 0.99 (0.29-3.30) | 0.97 (0.37-2.56) | 0.96 | 0.68 | 0.94 (0.71-1.23) | 0.19 | |
| Modified Western**‡** | | Male | 1.00 | 1.90 (0.68-5.29) | 0.67 (0.23-1.98) | 1.21 (0.46-3.19) | 0.30 (0.11-0.85)\* | 0.02\* | 0.01\* | 0.75 (0.58-0.96)\* | 0.47 | |
| Prudent**‡** | | Male | 1.00 | 2.30 (0.79-6.72) | 2.38 (1.04-5.46)\* | 2.00 (0.71-5.64) | 1.82 (0.69-4.81) | 0.23 | 0.35 | 1.17 (0.79-1.74) | 0.10 | |
| Food Insecurity**†** | | Female | 1.00 | 1.65 (0.76-3.59) | 1.82 (0.71-4.64) | 2.26 (1.00-5.10) | 3.48 (1.49-8.09)\*\* | <0.01\*\* | <0.01\*\* | 1.59 (1.22-2.07)\*\* | 0.14 | |
| Age**†** | | Female | 1.00 | 1.80 (1.00-3.26) | 1.39 (0.61-3.19) | 1.02 (0.37-2.83) | 1.37 (0.67-2.82) | 0.38 | 0.81 | 0.97 (0.75-1.25) | 0.19 | |
| Food Assistance (SNAP)**†** | | Female | 1.00 | 2.09 (0.84-5.18) | 2.11 (1.04-4.28)\* | 3.80 (1.73-8.33)\*\* | 3.20 (1.63-6.28)\*\* | <0.01\*\* | <0.01\*\* | 1.53 (1.21-1.93)\*\* | 0.33 | |
| Household Size**†** | | Female | 1.00 | 1.66 (0.70-3.95) | 1.45 (0.70-3.01) | 3.74 (1.85-7.54)\*\* | 2.71 (1.16-6.35)\* | 0.02\* | <0.01\*\* | 1.45 (1.13-1.86)\*\* | 0.48 | |
| Modified Western**‡** | | Female | 1.00 | 0.36 (0.16-0.79)\* | 0.77 (0.37-1.59) | 1.55 (0.81-2.95) | 1.13 (0.52-2.47) | 0.76 | 0.12 | 1.14 (0.92-1.41) | 0.87 | |
| Prudent**‡** | | Female | 1.00 | 0.72 (0.27-1.91) | 1.24 (0.52-2.96) | 0.41 (0.16-1.02) | 0.31 (0.14-0.69)\*\* | <0.01\*\* | <0.01\*\* | 0.68 (0.54-0.86)\*\* | 0.27 | |
| Food Insecurity**†** | | 2-6 Years Since Dx | 1.00 | 3.11 (0.70-13.80) | 1.41 (0.32-6.28) | 2.14 (0.48-9.62) | 4.72 (1.26-17.70)\* | 0.02\* | 0.02\* | 1.39 (1.03-1.88)\* | 0.85 | |
| Age**†** | | 2-6 Years Since Dx | 1.00 | 1.03 (0.34-3.11) | 0.67 (0.19-2.29) | 1.33 (0.34-5.19) | 0.54 (0.14-2.08) | 0.37 | 0.54 | 0.79 (0.57-1.1) | 0.67 | |
| Food Assistance (SNAP)**†** | | 2-6 Years Since Dx | 1.00 | 3.78 (0.66-21.76) | 5.27 (0.96-28.93) | 6.42 (1.30-31.81)\* | 7.90 (2.18-28.66)\*\* | <0.01\*\* | <0.01\*\* | 1.65 (1.16-2.34)\*\* | 0.35 | |
| Household Size**†** | | 2-6 Years Since Dx | 1.00 | 7.66 (1.75-33.53)\*\* | 2.45 (0.52-11.56) | 4.22 (0.84-21.19) | 5.56 (1.37-22.55)\* | 0.02\* | 0.16 | 1.30 (0.92-1.82) | 0.72 | |
| Modified Western**‡** | | 2-6 Years Since Dx | 1.00 | 1.10 (0.27-4.52) | 0.79 (0.23-2.74) | 4.98 (1.73-14.37)\*\* | 1.32 (0.41-4.28) | 0.64 | 0.13 | 1.23 (0.86-1.74) | 0.43 | |
| Prudent**‡** | | 2-6 Years Since Dx | 1.00 | 0.94 (0.31-2.84) | 1.27 (0.41-3.97) | 0.86 (0.26-2.89) | 0.50 (0.12-2.11) | 0.35 | 0.36 | 0.80 (0.51-1.25) | 0.17 | |
| Food Insecurity**†** | | 6 Years Since Dx | 1.00 | 0.69 (0.33-1.45) | 1.02 (0.43-2.42) | 1.54 (0.78-3.04) | 2.11 (0.86-5.13) | 0.10 | 0.03\* | 1.54 (1.13-2.12)\*\* | 0.14 | |
| Age**†** | | 6 Years Since Dx | 1.00 | 2.66 (1.41-5.04)\*\* | 1.42 (0.57-3.56) | 0.99 (0.30-3.28) | 2.79 (1.23-6.32)\* | 0.01\* | 0.25 | 1.14 (0.89-1.47) | 0.53 | |
| Food Assistance (SNAP)**†** | | 6 Years Since Dx | 1.00 | 1.15 (0.46-2.88) | 0.98 (0.45-2.13) | 2.35 (0.88-6.24) | 1.94 (0.80-4.69) | 0.14 | 0.08 | 1.37 (1.03-1.83)\* | 0.50 | |
| Household Size**†** | | 6 Years Since Dx | 1.00 | 1.10 (0.42-2.89) | 1.01 (0.44-2.34) | 2.47 (1.16-5.26)\* | 2.03 (0.79-5.21) | 0.14 | 0.02\* | 1.30 (0.99-1.70) | 0.25 | |
| Modified Western**‡** | | 6 Years Since Dx | 1.00 | 0.75 (0.37-1.50) | 0.43 (0.20-0.94)\* | 1.74 (0.87-3.49) | 0.90 (0.39-2.07) | 0.80 | 0.54 | 1.03 (0.82-1.28) | 0.81 | |
| Prudent**‡** | | 6 Years Since Dx | 1.00 | 0.73 (0.27-1.97) | 0.84 (0.35-2.03) | 0.39 (0.16-0.95)\* | 0.33 (0.14-0.79)\* | 0.01\* | <0.01\*\* | 0.64 (0.50-0.82)\*\* | 0.04\* | |
| Food Insecurity**†** | | 2 Years Since Dx | 1.00 | 2.52 (0.45-14.10) | 1.76 (0.32-9.62) | 4.01 (1.25-12.83)\* | 1.74 (0.28-10.65) | 0.54 | 0.52 | 1.58 (0.93-2.69) | 0.27 | |
| Age**†** | | 2 Years Since Dx | 1.00 | 1.17 (0.19-7.35) | 2.76 (0.54-14.08) | 2.13 (0.46-9.76) | 1.83 (0.3-11.05) | 0.50 | 0.28 | 1.17 (0.73-1.88) | 0.90 | |
| Food Assistance (SNAP)**†** | | 2 Years Since Dx | 1.00 | 1.17 (0.13-10.46) | 3.00 (0.80-11.28) | 1.92 (0.60-6.16) | 0.89 (0.15-5.13) | 0.89 | 0.85 | 1.17 (0.72-1.88) | 0.72 | |
| Household Size**†** | | 2 Years Since Dx | 1.00 | 1.83 (0.46-7.24) | 1.33 (0.26-6.73) | 3.06 (0.78-12) | 1.87 (0.5-6.97) | 0.34 | 0.35 | 1.04 (0.67-1.62) | 0.29 | |
| Modified Western**‡** | | 2 Years Since Dx | 1.00 | 1.69 (0.22-12.76) | 2.08 (0.42-10.38) | 1.64 (0.39-6.89) | 1.80 (0.37-8.83) | 0.46 | 0.48 | 0.98 (0.63-1.53) | 0.49 | |
| Prudent**‡** | | 2 Years Since Dx | 1.00 | 2.86 (0.57-14.26) | 4.59 (0.92-23) | 2.18 (0.45-10.58) | 1.02 (0.22-4.65) | 0.98 | 0.74 | 1.11 (0.81-1.52) | 0.56 | |
| Food Insecurity**†** | | High School | 1.00 | 0.55 (0.26-1.16) | 0.81 (0.35-1.87) | 1.20 (0.56-2.57) | 0.91 (0.43-1.91) | 0.79 | 0.69 | 1.15 (0.9-1.48) | 0.16 | |
| Age**†** | | High School | 1.00 | 2.12 (1.03-4.36)\* | 1.42 (0.54-3.74) | 1.15 (0.46-2.87) | 1.39 (0.61-3.18) | 0.43 | 0.72 | 0.96 (0.74-1.25) | 0.24 | |
| Food Assistance (SNAP)**†** | | High School | 1.00 | 0.88 (0.36-2.11) | 1.16 (0.58-2.33) | 1.58 (0.75-3.30) | 1.11 (0.52-2.38) | 0.78 | 0.45 | 1.08 (0.84-1.39) | 0.69 | |
| Household Size**†** | | High School | 1.00 | 1.81 (0.82-3.97) | 0.92 (0.39-2.16) | 1.94 (0.78-4.83) | 1.39 (0.58-3.33) | 0.46 | 0.47 | 1.06 (0.83-1.36) | 0.93 | |
| Modified Western**‡** | | High School | 1.00 | 0.81 (0.33-1.99) | 0.77 (0.30-1.94) | 1.01 (0.43-2.39) | 1.10 (0.5-2.43) | 0.81 | 0.72 | 1.01 (0.76-1.36) | 0.18 | |
| Prudent**‡** | | High School | 1.00 | 1.14 (0.59-2.21) | 1.33 (0.58-3.08) | 0.76 (0.32-1.84) | 0.76 (0.34-1.67) | 0.49 | 0.35 | 0.98 (0.76-1.26) | 0.75 | |
| Food Insecurity**†** | | Some College | 1.00 | 2.34 (0.83-6.59) | 2.98 (1.00-8.88)\* | 3.30 (0.98-11.06) | 9.21 (3.37-25.13)\*\* | <0.01\*\* | <0.01\*\* | 2.12 (1.46-3.07)\*\* | 0.14 | |
| Age**†** | | Some College | 1.00 | 1.36 (0.61-3.03) | 0.81 (0.25-2.59) | 1.64 (0.41-6.57) | 1.89 (0.69-5.12) | 0.21 | 0.27 | 1.11 (0.79-1.55) | 0.84 | |
| Food Assistance (SNAP)**†** | | Some College | 1.00 | 3.64 (1.33-9.97)\* | 3.06 (1.32-7.10)\*\* | 5.76 (1.87-17.71)\*\* | 6.07 (2.25-16.37)\*\* | <0.01\*\* | <0.01\*\* | 1.88 (1.33-2.65)\*\* | 0.44 | |
| Household Size**†** | | Some College | 1.00 | 1.44 (0.39-5.37) | 0.81 (0.31-2.14) | 2.50 (0.85-7.35) | 4.68 (1.78-12.27)\*\* | <0.01\*\* | <0.01\*\* | 1.8 (1.32-2.45)\*\* | 0.66 | |
| Modified Western**‡** | | Some College | 1.00 | 0.66 (0.24-1.79) | 0.76 (0.29-1.99) | 2.21 (0.98-4.98) | 0.9 (0.32-2.53) | 0.84 | 0.42 | 1.08 (0.82-1.41) | 0.40 | |
| Prudent**‡** | | Some College | 1.00 | 0.67 (0.17-2.61) | 1.02 (0.32-3.24) | 0.52 (0.18-1.47) | 0.23 (0.07-0.73)\* | 0.01\* | 0.01\* | 0.57 (0.42-0.78)\*\* | 0.02\* | |
|  | **Supplementary Table 3.** Stratified odds ratios† and 95% confidence intervals for the relationship between the dietary patterns scores and the odds of being food insecure.  \*\*  *p* < 0.01  \* *p* < 0.05  a All models adjusted for age, sex, race/ethnicity, family income-to-poverty ratio, highest level of education attained, household size, SNAP participation status, BMI, estimated caloric intake, weekly MET minutes, primary cancer site, smoking status, and the Charlson Comorbidity Index score and were weighted according to guidelines provided by the NCHS.  b Odds ratio (HR) corresponding to a standard deviation increase in the diet pattern score.  c Wald test *p*-value for a quadratic polynomial term.  **†** Dietary pattern obtained using penalized logistic regression.  **‡** Dietary pattern obtained using principal components analysis (PCA). | | | | | | | | | | |

Graphical user interface, chart, diagram

Description automatically generated

**Supplementary Figure 1.** Optimal Combinations of and (minimizers) in each of the penalized logistic regression models used for dietary patterns extraction performed on subsample A (n = 3,117).

**Chart, line chart

Description automatically generated**

**Supplementary Figure 2.** Scree plot from the PCA dietary extractions procedure performed on subsample B (n = 433).