

RISK OF INCREASED MORTALITY IN UNDERWEIGHT SURVIVORS: A REPORT FROM THE CHILDHOOD CANCER SURVIVOR STUDY.

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Background: Approximately one in ten adult survivors of childhood cancer is underweight. While the consequences of being overweight or obese have been well-described, outcomes among underweight childhood cancer survivors are unknown.

Methods: Underweight was defined as a body mass index (BMI) < 18.5 kg/m², calculated from self-reported height and weight on either the baseline or the first follow-up questionnaire from the Childhood Cancer Survivor Study (CCSS). National Death Index provided death data and self-reported subsequent malignant neoplasm were validated by pathology report. Chi-square test was used to examine the association between underweight status (< 18.5 kg/m² vs ≥ 18.5 kg/m²) and baseline demographic characteristics. Marginal models with generalized estimating equations were used to evaluate the associations between BMI and outcomes.

Results: Of 9454 survivors (median age 35 years old (range 17-58), with an average of 17.5 years from diagnosis), 627 (6.6%) participants were underweight at baseline and had at least two years of additional follow-up. 29 of 184 deaths were among underweight survivors. In univariate analysis, underweight status was more common among females (9.1% vs 4.5 %, P<.01) and participants with younger age (8.2% for <5 yrs vs 6.1% for ≥5yr, p<.01), lower household income (8.9% for <\$20,000 vs 6.0% for ≥\$20,000, p<.01), and a history of a grade 3-4 chronic condition (p=0.05). After adjustment for these factors, in addition to race/ethnicity, prior smoking, and a history of radiation therapy, the odds of all-cause mortality within two years of BMI report was 2.82 (95%CI: 1.64-2.2; P<0.01) for underweight survivors, compared to normal weight survivors. The risk of subsequent malignant neoplasms within two years of BMI report among underweight survivors compared to normal weight survivors was not significantly increased (OR 1.31; 95%CI: 0.60-2.85; P=0.49).

Conclusions: Childhood cancer survivors who are underweight are at significant risk for late mortality that is unrelated to smoking status, chronic illness, or second malignancy. Whether targeted nutritional interventions would ameliorate this risk is unknown.