

IMPACT OF CHRONIC DISEASE ON PSYCHOLOGICAL DISTRESS IN ADULT SURVIVORS
IN THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)

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Purpose: Adult survivors of childhood cancer are at increased risk of developing both chronic health conditions and symptoms of psychological distress. While cardiac, pulmonary and endocrine conditions have been associated with anxiety and depression in non-cancer populations, their contribution to psychological distress has not been examined in adult survivors of childhood cancer.

Methods: Participants included 5,021 adult survivors of childhood cancer (mean[SD] age=32.0[7.6] years, time since diagnosis=23.2[4.5] years) diagnosed between 1970-86 who completed a measure of acute psychological distress (Brief Symptom Inventory-18 [BSI-18]). Health conditions were graded using the Common Terminology Criteria for Adverse Events (CTCAE) version 4.0 for cardiac, pulmonary and endocrine conditions that preceded the date of reported distress. Structural equation modeling was used to examine pathways between treatment exposures, chronic health conditions (\geq Grade 1 vs. none), and elevated symptoms of psychological distress (BSI T-scores \geq 63).

Results: In the final path models for anxiety and depression, anthracycline exposure was associated with cardiac morbidity (anxiety: $\beta=0.15$, $p<0.001$; depression: $\beta=0.21$, $p<0.001$); cranial irradiation was associated with endocrine morbidity (anxiety: $\beta=2.1$, $p<0.001$; $\beta=2.1$, $p<0.001$, respectively); and, both cardiac and endocrine conditions contributed to pulmonary morbidity (anxiety: $\beta=0.16$, $p<0.001$; $\beta=0.11$, $p<0.001$, respectively; depression: $\beta=0.17$, $p<0.001$; $\beta=0.09$, $p=0.006$, respectively). Chronic pulmonary conditions were associated with elevated symptoms of depression ($\beta=0.13$, $p<0.001$) and anxiety ($\beta=0.15$, $p<0.001$); endocrine conditions were associated with elevated depressive symptoms ($\beta=0.12$, $p<0.01$) but not anxiety, and cardiac conditions were associated with anxiety ($\beta=0.13$, $p<0.001$) but not depression.

Conclusions: Chronic health conditions resulting from exposure to toxic cancer therapies in childhood contribute to psychological distress in adult survivors. Early intervention for cardiac, pulmonary and endocrine conditions may reduce risk for distress and improve emotional quality of life.