Chronic Health Conditions Lead to Negative Employment Transitions Among Survivors of Childhood Cancer: A Report from the Childhood Cancer Survivor Study (CCSS)

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Aim: To study associations between chronic health conditions and negative employment transitions among survivors of childhood cancer

Background & Methods: While chronic health conditions are prevalent among childhood cancer survivors, their impact on maintaining employment, a common indicator of socioeconomic independence, has not been studied. Self-reported employment status (full-time [FT], part-time [PT], unemployed [any reason], not in labor force) was assessed at two timepoints (T1:2002-04 and T2:2015-16) in adult (≥25y old) survivors of childhood cancer diagnosed between 1970-86. Sex-stratified Poisson regression, adjusted for race and ages at diagnosis and T2, was used to study associations between timing and severity of health conditions (graded per the CTCAE v4.03) and transitions from FT to PT or unemployed.

Results: Survivors employed FT at T1 (males=1712, median age [min-max]: 34y [25-53]; females=1337, 33y [25-53]) reporting employment status at T2 were included. At T2 (median time from T1 11.5y [9.4-13.8]), 83% males and 70% females remained employed FT, but 4% and 10% transitioned to PT, and 11% and 12% to unemployed (additionally 2% and 8% left the labor force), respectively. Male and female survivors with grade 2 or 3-4 neurologic conditions acquired before T1 or between T1-T2 were at a higher risk of moving from FT to PT or unemployed compared to those with grade 0-1 conditions. Those with grade 3-4 respiratory conditions prior to T1 and cardiac and musculoskeletal conditions acquired between T1-T2 were also at higher risk for moving to PT or unemployed. Additional predictors for males included grade 2 vision and endocrine conditions (Table).

Conclusions: A substantial portion of adult survivors of childhood cancer with health conditions of varying severity leave FT employment. Increased awareness of all stakeholders may facilitate access to clinical counseling and occupational provisions for flexible and supportive accommodations to reduce work-related barriers for childhood cancer survivors.

Table. Associations between timing, severity, and type of chronic health conditions and negative employment transitions

Condition/ Grade	Occurred before T1		Occurred between T1-T2	
	Female RR (95% CI)	Male RR (95% CI)	Female RR (95% CI)	Male RR (95% CI)
Neurological				
Grade 0-1	1.0	1.0	1.0	1.0
Grade 2	**1.7 (1.2-2.2)**	**1.8 (1.3-2.5)**	**2.5 (1.7-3.5)**	**2.2 (1.6-3.1)**
Grade 3-4	**1.8 (1.3-2.6)**	**1.6 (1.1-2.3)**	**2.9 (2.0-4.0)**	**3.8 (2.8-5.2)**
Respiratory				
Grade 0-1	1.0	1.0	1.0	1.0
Grade 2	1.4 (1.0-2.0)	1.0 (0.6-1.6)	1.1 (0.7-1.9)	0.6 (0.1-2.8)
Grade 3-4	**2.5 (1.5-4.1)**	**2.1 (1.2-3.5)**	1.3 (0.6-2.6)	2.9 (1.4-5.8)
Cardiac				
Grade 0-1	1.0	1.0	1.0	1.0
Grade 2	1.0 (0.7-1.3)	0.9 (0.7-1.2)	0.9 (0.7-1.2)	1.0 (0.7-1.3)
Grade 3-4	0.8 (0.5-1.1)	1.2 (0.9-1.7)	**1.8 (1.4-2.3)**	**1.9 (1.5-2.4)**
Musculoskeletal				
Grade 0-1	1.0	1.0	1.0	1.0
Grade 2	2.5 (0.4-14.6)	2.5 (0.9-6.9)	-	-
Grade 3-4	1.0 (0.7-1.5)	1.0 (0.6-1.7)	**1.7 (1.0- 2.8)**	**2.7 (1.8- 4.1)**
Vision				
Grade 0-1	1.0	1.0	1.0	1.0
Grade 2	-	**2.3 (1.5-3.3)**	-	**1.7 (1.1-2.7)**
Grade 3-4	-	1.5 (1.0-2.2)	-	0.6 (0.3-1.4)
Endocrine				
Grade 0-1	1.0	1.0	1.0	1.0
Grade 2	-	**1.4 (1.1-1.9)**	-	1.7 (1.3-2.3)
Grade 3-4	-	1.3 (0.9-1.8)	-	1.3 (0.9-1.9)

('-' = not estimable)