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Title: Positive psychological outcomes for pediatric cancer survivors: A report from the Childhood Cancer Survivor Study (CCSS)

Background/Purpose: Happiness and positive emotional wellbeing can be operationalized in different ways, including with the PERMA model (Seligman, 2011): Positive emotions, Engagement, Relationship, Meaning, and Accomplishments. Neither this model nor others have been widely applied to pediatric cancer survivors. The goal of this study was to examine relationships between common measures of emotional wellbeing and happiness to determine whether these states represent a single or multiple construct(s) of positive psychological outcomes for childhood cancer survivors.

Methods: A sample of 1,460 young adult survivors of childhood cancer from CCSS who were diagnosed with cancer before the age of 10 (53% female, mean [range] 22 [19-24] years old, time since diagnosis 18 [14-19] years) completed the Posttraumatic Growth Inventory (PTGI, a measure of emotional wellbeing) and Cantril Ladder of Life (LOL, a measure of happiness). The PTGI has five subscales: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation for Life. The LOL asks survivors to rate past, current, and future life satisfaction. A Confirmatory Factor Analysis was conducted to compare a one-factor solution that comprised subscales from the LOL and the PTGI with a two-factor solution of PTGI and LOL as distinct latent constructs.

Results: The result of the two-factor model showed a good fit ($\chi2$ (20)=134.66, $p<0.001$; SRMR= 0.05; RMSEA= 0.06, 95% CI= [0.05 0.07]; CFI= 0.98). The two factors were positively, though weakly, correlated (r=0.15, $p<0.001$). The life satisfaction construct had standardized factor loadings for the three indicators that ranged from 0.46 to 0.99, and the factor loadings for PTG construct ranged from 0.70 to 0.93. The result of the one-factor model suggested that it was not a good fit ($\chi2$ (21) = 973.01, $p<0.001$; SRMR = 0.13; RMSEA = 0.17, 95% CI = [0.17 0.18]; CFI = 0.83). When comparing the two models, model fit was significantly worse with the one-factor model, indicating that the life satisfaction and PTG constructs are distinct (χ^2_D (1) = 838.25, df_D = 1, $p<0.001$).

      Conclusion: Life satisfaction and posttraumatic growth are related but distinct constructs that have a weak, though statistically significant, association with each other. This pattern may explain why some cancer survivors are satisfied with their current life and explore life in a more positive way, while other may perceive positive growth but not be satisfied. Future surveys, enhanced with the PERMA model, should ask about the five pillars of happiness, with the goal to understanding why some survivors attain happiness and others do not.