

# Impact of Cognitively-Based Compassion Training on Quality of Life and Diurnal Cortisol Rhythm Within Cancer Survivor-Informal Caregiver Dyads

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After primary cancer treatments, survivors and their informal caregivers (i.e., family members or friends) often experience impairments in quality of life (QOL). Impairments in QOL experienced by survivors have been found to be interdependent with QOL impairments experienced by caregivers, and may involve stress-related biological pathways including diurnal cortisol rhythm (DCR), i.e., the change in cortisol from high in morning to low in evening. Although interventions have been developed to improve survivors' and caregivers' QOL, few have involved contemplative approaches (i.e., meditation interventions), and few have determined whether such interventions may impact stress-related biology within survivor-caregiver dyads. The goal of this work therefore was to determine in a preliminary manner if a contemplative intervention called Cognitively-Based Compassion Training (CBCT) improves QOL and DCR within survivors-caregiver dyads. Dyads (N = 41) included solid tumor survivors within 10 years of completing primary cancer treatments and their caregivers. Dyads were randomized 1:1 to CBCT or an 8-week active attention control (cancer health education, CHE). Ferrans' and Power's Quality of Life Index (QLI) was used to assess overall QOL and its dimensions. Linear mixed effects models related post-intervention QOL scores to trial arm in interaction with dyadic relationship, controlling for QOL at baseline. A subset of dyads (N=37) also collected saliva samples in the home immediately upon waking and again before retiring for the evening over 2 consecutive days before, shortly after, and 1 month after interventions. Differences in associations of DCR metrics in CBCT vs. CHE were assessed using general linear models, relating survivor cortisol to caregiver cortisol at each time point, study group (CBCT or CHE), and caregiver cortisol by study group interaction. Mean survivor age was 62 (range 38-84) and 88% were female, and mean caregiver age was 61 and 61% were female. Although there was no difference in QLI between CBCT and CHE among survivors, dyadic relationship moderated intervention effects on the health and functioning QLI subscale ( $p=.003$  for arm by relationship interaction), with no difference by arm among dyads with non-spouses, and significantly higher scores in the CBCT arm among dyads with spouses/partners ( $p=.003$ ,  $d=1.38$ ). Similar results were seen for QLI total. Among caregivers, there was no difference in QLI between CBCT and CHE, and dyadic relationship did not moderate intervention effects for caregivers. There was no difference in DCR between CBCT and CHE among survivors or caregivers. However, dyads randomized to CBCT showed within-dyad associations for both PM cortisol ( $r=.72, p=.01$ ) and cortisol slope ( $r=.62, p=.06$ ), while dyads randomized to CHE did not. Findings from this pilot study suggest that QOL improvements for survivors as a result of CBCT may be greater when dyads include ICs that are spouses/partners or those within the "social orbit" of survivors. At face value, the findings also suggest that CBCT may promote synchrony of DCR within survivor-caregiver dyads. Further research is needed to address these possibilities.