

Title: BMI of parents of 4th graders increased over 2 to 4 years independent of stress, age, gender, and parent engagement.

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Objective: Examine weight changes among parents of 4th graders when both participated in a randomized controlled trial of a school-based intervention focused on culinary and physical activity experiences in northern Colorado.

Methods: Fuel for Fun (FFF) is a year-long school-based, culinary-driven program for 4th graders that includes cafeteria, physical and family-based activities as well as parent participation in online nutrition education. Student cohorts were designated as either control or FFF intervention. Parents had youth attending schools assigned to 1 of 4 treatments that varied in type and intensity of parent involvement. Data were collected via a Qualtrics online survey completed (2012 to 2018) by intervention and control parents at baseline (BL), end of first year (FU1), beginning of 5th grade (FU2) and year 6 (FU3). The survey included self-report height, weight, sociodemographic factors and eating behaviors, attitudes, and psychosocial attributes using validated measures for sense of coherence, physical activity, eating competence, stress and parent engagement. Low-income was defined as either worrying about money for food or using nutrition assistance. Sociodemographic differences were examined using chi-square, and means testing. BMI change was examined using GLM with repeated measures controlling for BL sociodemographic factors.

Results: Parents (n=418 BL, 225 FU1, 225 FU2 and 115 FU3) were predominantly female (88%), white (92%), and well educated (33% undergraduate, 36% graduate degree). BL mean BMI was 26.1 ± 5.9 ; 51% normal BMI, 29% overweight and 19.0% obese. Mean age was 39.2 ± 5.9 y at FU3. There were > females, educational level \leq high school, lower-income and lower EC (all $P < 0.05$).

BMI change from BL through to FU3 was significant ($p < 0.05$) after controlling for age, stress, gender and parent treatment group. Parents with children in the FFF group had a greater weight gain over time ($P = .026$), even after controlling for age, stress, low-income status, cohort and proportion of parent engagement. BMI change over time was not significant when controlling for ethnicity. Unlike parents, BMI (BL, FU1, FU2, and FU3) remained stable among student groups. BMI change was significantly different among physical activity categories (International Physical Activity Questionnaire (IPAQ)) at FU3 when controlling for the change in BMI by student group ($P = .053$). IPAQ categories at FU3 did not change by student group. At year 6 (FU3). BMI remained stable over the study period, even after controlling for student cohort, parent treatment group, sociodemographic and psychosocial behaviors.

Conclusions: Overall, parents in the FFF intervention gained weight over time compared to controls.

Keywords: weight stability, school-age youth, stress, eating competence