



Table 4-D.1. Studies Examining the Effects of Nutrition Education Combined with Changes to the Food Environment

Nutrition Education Plus Food Environment Change vs. Food Environment Change Only

Study	Participants	Study Description	Outcomes	Limitations
<p>Birnbaum et al, 2002</p> <p>Positive Quality</p> <p>Randomized Controlled Trial</p>	<p>N=3,503</p> <p>Age: Seventh grade</p> <p>Gender: Not reported</p> <p>Race: 69% White, 10% African American, 7% Asian or Pacific Islander, 6% Mixed, 9% Other</p> <p>SES: ≥20% eligible for free or reduced-price meals</p> <p>Location: United States</p>	<p>Intervention 1: Received a peer leadership component plus classroom nutrition education plus environment intervention (increased availability and promotion of fruits and vegetables in the school cafeteria and vending machines) (nutrition education plus changes to the school food environment) (two years)</p> <p>Intervention 2: Received classroom nutrition education plus the school environment intervention (nutrition education plus changes to the school food environment) (two years)</p> <p>Intervention 3: Received the school environment intervention only (changes to the school food environment alone) (two years)</p> <p>Control: Did not receive any intervention</p>	<p>Intervention 1 increased fruit and vegetable intake (+1 serving; P<0.05) and fruit intake (+0.5 serving; P=0.01), and had a borderline significant increase in vegetable intake (+0.4 servings; P=0.059).</p> <p>Intervention 2 had borderline significant increases in fruit and vegetable intake (+0.5 servings; P=0.056) and fruit intake (+0.25 servings; P=0.052).</p> <p>Intervention 3 and Control had no changes in fruit or vegetable intake.</p>	<p>Peer leaders may have been more likely to give more socially desirable answers.</p>
<p>He et al, 2009</p> <p>Neutral Quality</p> <p>Randomized Controlled Trial</p>	<p>N=1,277</p> <p>Age: 12 years</p> <p>Gender: 55% female</p> <p>Race: Not reported</p> <p>SES: Not reported</p> <p>Location: Canada</p>	<p>Intervention 1: Received a free fruit and vegetable snack (three times per week) and enhanced classroom nutrition education (nutrition education plus changes to the school food environment) (21 weeks)</p> <p>Intervention 2: Received a free fruit and vegetable snack (three times per week) (changes to the school food environment alone) (21 weeks)</p> <p>Control: Did not receive any intervention</p>	<p>Intervention 1 consumed more fruits and vegetables at school compared to control (0.49 serving per day; P<0.05).</p> <p>There were no significant (NS) differences in school fruit and vegetable consumption between Intervention 2 and either the Control group or Intervention 1.</p> <p>There were NS differences between any of the groups in fruit and vegetable intake at home.</p>	<p>The 24-hour recall used has been validated, but was not pre-tested in this study population. The 24-hour recall was complicated, which may have resulted in a substantial number of missing values.</p> <p>Due to missing values, sample size decreased, and the study may not have been adequately powered.</p>



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Horne et al, 2004 Positive Quality Non-Randomized Controlled Trial	N=749 Age: 5 years to 11 years Gender: Not reported Race: More than 80% Ethnic minorities ES: 46% to 67% eligible for free meals Location: United Kingdom	Intervention: Received fruit at snack time, rewards for consuming the fruit and nutrition education videos (nutrition education plus changes to the school food environment) (16 days plus a four-month maintenance phase) Comparison: Received fruit at snack time (changes to the school food environment only) and rewards for consuming the fruit (16 days plus four-month maintenance phase)	Lunchtime consumption of fruits and vegetables in the nutrition education plus changes to the school food environment group was significantly higher immediately after the intervention and after the maintenance phase than baseline compared to the school food environment-only group (P<0.001). Snack time consumption was higher after the intervention than baseline compared to changing to the school food environment only (P<0.001) (but not after the maintenance phase). Home fruit and vegetable consumption increased after the intervention in the combination group compared to the food environment-only group (P<0.05).	Intervention was short, and it was unclear how outcomes would have changed had the intervention phase been longer. The maintenance phase was not implemented consistently.
Prell et al, 2005 Neutral Quality Randomized Controlled Trial	N=228 Age: 14 years Gender: 47% female Race: Not reported SES: Not reported Location: Sweden	Intervention 1: Received changes to the school cafeteria (increased choice, marketing and improved preparation/appearance of fish) and home economics nutrition education (five weeks) (nutrition education plus changes to the school food environment) Intervention 2: Received changes to the school cafeteria (five weeks) (changes to the school food environment only) Control: Did not receive any intervention	Intervention 1 significantly increased fish consumption following the intervention, and this increase differed significantly from the control group (P<0.01). Intervention 2 had NS impact on fish consumption, and did not differ from Intervention 1 or the Control group.	Baseline differences in fish consumption between groups may have influenced results. Did not include a comparison group that received the home economics education alone to determine the impact of this component alone on fish consumption. Inadequate control for potentially confounded factors .



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Ask et al, 2006 Neutral Quality Non-Randomized Controlled Trial	N=54 Age: 15 years Gender: 46% female Race: Not reported SES: Not reported Location: Norway	Intervention: Received nutrition education and a free breakfast at the beginning of each school day (nutrition education plus changes to the school food environment) (four months) Comparison: Received nutrition education (four months) (nutrition education alone)	Males in the intervention group had a significant increase in their healthy eating index scores after the intervention (P<0.001), while there was NS change among males in the comparison group. There were no changes in the healthy eating index score of females in either group.	Small sample size. Lack of teacher participation delayed lesson implementation. Study staff were not well trained, and the study was not well implemented. Regular breakfast consumption at home was not assessed or accounted for. Use of a non-validated dietary assessment tool.