

Overview Table

Table 4-E.2. Studies examining the effects of multi- vs. single-component nutrition education interventions

Author, year	Description of Intervention, Comparison, and/or Control			Study Population	Description of Outcomes	Limitations
	Single-Component Intervention	Multi-Component Intervention	Control			
Debar, 2006 Positive Quality Randomized Controlled Trial	Individual counseling visits	<ul style="list-style-type: none"> Individual counseling visits Telephone calls Group meetings Diet self-monitoring Use of a study website Youth/parent newsletters Fitness center membership 	N/A	N = 209 Age: 15 yrs Location: United States Gender: 100% female Race: 81% White SES: Majority middle- to upper-middle income	The multi-component group compared to the single-component group reported greater intake of: <ul style="list-style-type: none"> – Calcium in both study years (adjusted mean difference [AMD], 216.6 and 241.3 mg, respectively; P<0.001) – Vitamin D in the first year (AMD, 34.3 IU; P<0.02) – Fruits and Vegetables in both years (AMD, 0.74 and 0.79 servings, respectively; P<0.001). No effects on soda consumption were found.	Limited generalizability (population was largely white, middle- to upper-middle-income females, with relatively high calcium intake at baseline) Some intervention elements may not be easily replicated in all medical settings. Health plans might have less participant contact than schools do.
He et al., 2009 Neutral Quality Randomized Controlled Trial	Free fruit/vegetable snack	<ul style="list-style-type: none"> Free fruit/vegetable snack Classroom nutrition education 	No intervention control	N = 1,277 Age: 12 yrs Location: Canada Gender: 55% female Race: N/A SES: N/A	The Multi-Component group consumed more fruits and vegetables at school compared to control (0.49 serving/d; P< 0.05). There were no significant differences in school fruit and vegetable consumption between the Single-Component group and control. There were no significant differences between any of the groups in fruit and vegetable intake at home.	The 24-hr recall used has been validated, but was not pre-tested in this study population. The 24-hr recall was complicated, which may have resulted in a substantial number of missing values. Due to missing values, sample size decreased, and the study may not have been adequately powered.
Hopper, 2005 Positive Quality Randomized Controlled Trial	Usual school nutrition education curriculum	<ul style="list-style-type: none"> Classroom nutrition education Physical education Parental involvement 	N/A	N = 238 Age: 9 yrs Location: United States Gender: 49% female Race: 83% White, 5% Native American, 5% Asian, 5% Hispanic, 2% African American SES: N/A	The multi-component group had significantly lower total fat intake (64.68 ±0.87 vs. 57.05±4.21; P<0.05) compared to the single-component group. There were no differences between the groups in other dietary intake variables measured.	Research is needed to determine how to deliver the intervention with increased parent participation, and less time/resource burden for teachers Parent participation rates were low
Hopper et al., 1996 Neutral Quality Randomized Controlled Trial	Classroom nutrition education	<ul style="list-style-type: none"> Classroom nutrition education Parental involvement 	Usual school nutrition education curriculum	N = 132 Age: 12 yrs Location: United States Gender: N/A Race: N/A SES: N/A	There were no significant differences in fat intake between the multi-component and single component intervention groups, though both groups decreased fat intake compared to control (p<0.05)	The intervention was delivered at the classroom level, making it difficult to control variations in delivery between classrooms. Low parental participation rates

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<p>Kitzman-Ulrich et al., 2009</p> <p>Neutral Quality Randomized Controlled Trial</p>	Family-based psychoeducation	<ul style="list-style-type: none"> Family-based psychoeducation Multifamily group therapy 	No intervention control	<p>N = 42</p> <p>Age: 13 yrs</p> <p>Location: United States</p> <p>Gender: 100% female</p> <p>Race: 55% White</p> <p>SES: N/A</p>	Energy intake decreased in the single-component group (-365 kcal/day) compared to the multi-component (+61 kcal/d) and control (+327 kcal/d) groups (P<0.01).	<p>Modest attendance rates (below 50%) may have reduced the impact of the intervention or results in selection bias</p> <p>Long-term research is needed to determine effects on weight/BMI</p> <p>24-hr dietary recall may not be accurate</p> <p>Small sample size</p>
<p>Long, 2004</p> <p>Neutral Quality Non-Randomized Controlled Trial</p>	Usual school nutrition education curriculum	<ul style="list-style-type: none"> Classroom nutrition education Web-based nutrition education 	N/A	<p>N = 121</p> <p>Age: 13 yrs</p> <p>Location: United States</p> <p>Gender: 52% female</p> <p>Race: 47% White, 40-43% Hispanic, 10-13% Black</p> <p>SES: N/A</p>	There were no differences between the intervention groups in consumption of fruit, vegetables, or fat	<p>As students were drawn from 2 volunteer schools, results may not be generalizable to other student populations</p> <p>The study was limited to education of individual adolescents, and changes to the home and school environment were not included; future research should include all strategies in order to determine the effects of education combined with supportive environmental changes</p> <p>Children in the single-component intervention received a much lower dose (0-3 hrs) compared to those in the multi-component intervention (~15 hrs)</p>
<p>McAleese & Rankin, 2007</p> <p>Neutral Quality Non-Randomized Controlled Trial</p>	Classroom nutrition education	<ul style="list-style-type: none"> Classroom nutrition education School gardening 	No intervention control	<p>N = 99</p> <p>Age: 11 yrs</p> <p>Location: United States</p> <p>Gender: 56% female</p> <p>Race: N/A</p> <p>SES: N/A</p>	The multi-component group increased fruit (1.3 servings; P<0.001), vegetable (1.44 servings; P<0.001), vitamin A (P=0.004); vitamin C (P=0.016), and fiber (P=0.001) intake compared to students in the single-component or control groups.	Non-randomized design limits generalizability to this specific study population
<p>McKenzie et al., 1996</p> <p>Positive Quality Randomized Controlled Trial</p>	Home nutrition education (parent-child auto-tutorial)	<ul style="list-style-type: none"> Individual counseling sessions (child and parent) Take-home nutrition education materials Telephone access to an RD 	No intervention control	<p>N = 303</p> <p>Age: 4–10 yrs</p> <p>Location: United States</p> <p>Gender: Males and females</p> <p>Race: N/A</p> <p>SES: N/A</p>	<p>The single-component group significantly decreased fruit intake (3.2 to 2.4 servings/day of fruit and fruit juice combined; P<0.006)</p> <p>There were no changes in any of the measured dietary-intake related outcomes following the intervention for either the multi-component or control groups, and there were no significant differences between groups.</p>	<p>Study population was mostly upper-class white children from highly educated two parent homes, which limits generalizability of the study</p> <p>Report changes in fruit intake, but do not distinguish between whole fruit, fruit juice, and 100% fruit juice</p>

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Neumark-Sztainer, 2003 Neutral Quality Randomized Controlled Trial	Distribution of educational materials on healthy eating and physical education	<ul style="list-style-type: none"> • Nutrition education sessions • Physical activity sessions • Social support sessions • Lunch meetings with healthy food • Parental involvement 	N/A	N = 190 Age: 15 yrs Location: United States Gender: 100% female Race: 42% White, 29% African American, 21% Asian, 4% Hispanic, 1% Native American, 3% Other SES: N/A	There were no significant differences between the multi- and single-component groups for any of the dietary intake-related outcomes measured	Study includes a subgroup from the larger school population and may not be representative Small sample size limits statistical power Short study length, more long-term studies are needed
Olvera, 2010 Neutral Quality Non-Randomized Controlled Trial	Individual counseling sessions	<ul style="list-style-type: none"> • Nutrition education sessions • Physical activity sessions • Behavioral counseling sessions 	N/A	N=35 Age: 10 yrs Location: United States Gender: 100% females Race: 100% Latino SES: N/A	There were no significant changes in any of the measured dietary intake-related outcomes in either study group	Small sample size, high dropout rate (76% completed the study), and exclusive analysis of Latina females limits study generalizability Short study duration; longer-term studies are needed
Parmer, 2009 Neutral Quality Non-Randomized Controlled Trial	Classroom nutrition education	<ul style="list-style-type: none"> • Classroom nutrition education • School gardening 	No intervention control	N = 115 Age: 7 yrs Location: United States Gender: 30% female Race: N/A SES: N/A	The multi-component group ate significantly more vegetables ($t=3.04, P<.01$), the single-component group had no significant change in consumption, and the control group ate significantly fewer vegetables ($t=-2.64, P<0.001$) at post-test compared the pre-test.	Relatively small sample size and short study length. Non-randomized design limits the scope of inference to this specific study population Study population may not be representative, limiting generalizability
Prell et al., 2005 Neutral Quality Randomized Controlled Trial	Modification of school meals	<ul style="list-style-type: none"> • Modification of school meals • Home economics education 	No intervention control	N = 228 Age: 14 yrs Location: Sweden Gender: 47% female Race: N/A SES: N/A	The multi-component group significantly increased fish consumption following the intervention, and this increase differed significantly from the control group ($P<0.01$). The single-component group had no significant change in fish consumption, and did not differ from control. The single-component and multi-component groups did not differ.	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.

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Reinaerts, 2008 Neutral Quality Randomized Controlled Trial	Free fruit/vegetable snack	<ul style="list-style-type: none"> Classroom nutrition education Parental involvement 	No intervention control	<p>N = 436</p> <p>Age: 8 yrs</p> <p>Location: The Netherlands</p> <p>Gender: 53% female</p> <p>Race: N/A</p> <p>SES: N/A</p>	<p>Both intervention groups increased fruit and total fruit, juice, and vegetable intake compared to control ($P < 0.05$)</p> <p>The single-component group also increased their vegetable snack intake ($p < 0.05$) and vegetable intake during dinner ($p < 0.01$), as compared to the multi-component and control groups</p>	<p>Schools were assigned randomly to interventions, but control schools were matched to intervention schools based on size/ethnicity, which resulted in significant baseline differences between groups</p> <p>High attrition rates (46% at yr 1, 75% at yr 2) due to missing questionnaires</p> <p>Few schools were willing to participate due to limited time</p> <p>The study relied heavily on parental reports for intake of their children which might threaten validity.</p>
Sahota et al., 2001 Positive Quality Randomized Controlled Trial	Usual school nutrition education curriculum	<ul style="list-style-type: none"> Teacher training Modification of school meals, foods sold in school Action plans for nutrition and physical education curriculum 	N/A	<p>N = 593</p> <p>Age: 8 yrs</p> <p>Location: United Kingdom</p> <p>Gender: 45% female</p> <p>Race: N/A</p> <p>SES: N/A</p>	<p>Results from the 24-hr recalls showed that the multi-component group had higher vegetable consumption compared to the single-component group (+0.3 portions/d, 95% CI 0.2, 0.4).</p> <p>Fruit consumption was lower in obese children in the multi-component group (-1.0 portions/d, 95% CI -1.8, -0.2) than those in the single-component group.</p> <p>Results from the 3-day food records showed that overweight children in the multi-component consumed more high sugar foods (+0.8 portions/day, 95% CI 0.1, 1.6) than the single-component group.</p>	<p>Inadequate sample size for group randomization (5 schools)</p> <p>Dietary intake-related outcomes were self-reported</p>