Supplementary Online Content


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eTable 3. Intervention Characteristics of Trials Included for Treatment Benefit (Key Questions 3-5)
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This supplementary material has been provided by the authors to give readers additional information about their work.
eSupplement Methods. Literature Search Strategies

CENTRAL
Issue 1 of 12, January 2015

#1 (obese or obesity or overweight or "over weight"):ti,ab,kw
#2 screen*:ti,ab,kw
#3 (body next mass next ind*):ti,ab,kw
#4 (body next mass next abdominal next ind*):ti,ab,kw
#5 (body next adiposity next ind*):ti,ab,kw
#6 (bmi or bmai):ti,ab,kw
#7 (skinfold or "skin fold"):ti,ab,kw
#8 (waist next circumference*):ti,ab,kw
#9 (waist near/3 ratio*):ti,ab,kw
#10 "weight for height":ti,ab,kw
#11 "weight for age":ti,ab,kw
#12 "weight stature":ti,ab,kw
#13 (adipos* near/2 measur*):ti,ab,kw
#14 anthropometr*:ti,ab,kw
#15 (#2-#14)
#16 (child* or teen or teens or teenage* or adolescen* or youth or youths or young people or (young next adult*) or pediatric* or paediatric* or schoolchildren or school children or preschool* or (pre next school*) or toddler*):ti,ab,kw
#17 #1 and #15 and #16 Publication Year from 2005 to 2015, in Trials
#18 (obese or obesity or overweight or "over weight"):ti,ab,kw
#19 (weight next gain*):ti,ab,kw or (weight next loss*):ti,ab,kw
#20 (weight next change*):ti,ab,kw
#21 (bmi or body mass index):ti,ab,kw near/2 (gain* or loss* or change*):ti,ab,kw
#22 "weight maintenance":ti,ab,kw
#23 "weight control":ti,ab,kw
#24 "weight management":ti,ab,kw
#25 (or #18-#24)
#26 (psychological or behavior* or behaviour*):ti,ab,kw next (therap* or modif* or chang* or strateg* or intervention*):ti,ab,kw
#27 (group or family or cognitive):ti,ab,kw next therap*:ti,ab,kw #28 cbt:ti,ab,kw
#29 (lifestyle or "life style"):ti,ab,kw next (chang* or interven* or modif*):ti,ab,kw
#30 counsel*:ti,ab,kw
#31 (social* next support*):ti,ab,kw
#32 (peer* near/2 support*):ti,ab,kw
#33 (child* near/3 parent*):ti,ab,kw and therap*:ti,ab,kw
#34 (family or parent*):ti,ab,kw next intervention*,:ti,ab,kw
#35 parent*:ti,ab,kw near/2 (behavior* or behaviour* or involv* or control* or attitude* or educat*):ti,ab,kw
#36 health:ti,ab,kw next (education or promotion):ti,ab,kw
#37 "patient education":ti,ab,kw
#38 (nonpharmacologic or "non pharmacologic"):ti,ab,kw next intervention*:ti,ab,kw

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<td>(self next regulat*):ti,ab,kw</td>
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<td>(multidisciplinary or multi-disciplinary):ti,ab,kw</td>
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<td>&quot;coordinated care&quot;:ti,ab,kw</td>
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<td>Xenical:ti,ab,kw</td>
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<td>Alli:ti,ab,kw</td>
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<td>Glucophage:ti,ab,kw</td>
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© 2017 American Medical Association. All rights reserved.
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<td>DE &quot;Lesson Plans&quot; OR DE &quot;Integrated Curriculum&quot; OR DE &quot;Curriculum Implementation&quot;</td>
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<td>DE &quot;Middle School Students&quot; OR DE &quot;Middle School Teachers&quot; OR DE &quot;Middle Schools&quot;</td>
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<tr>
<td>S5</td>
<td>S1 OR S2 OR S3 OR S4</td>
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<tr>
<td>S4</td>
<td>TI obesity OR TI obese OR TI overweight OR TI over weight</td>
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<td>S3</td>
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<td>S2</td>
<td>DE &quot;Body Composition&quot;</td>
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**Ovid Medline Screening**

Database: Ovid MEDLINE(R) <1946 to February Week 1 2015>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 09, 2015>, Ovid MEDLINE(R) Daily Update <February 09, 2015>

Search Strategy:

© 2017 American Medical Association. All rights reserved.
Obesity/
Obesity, Morbid/
Obesity, Abdominal/
Overweight/
Weight Gain/
obesity.ti,ab.
obese.ti,ab.
overweight.ti,ab.
over weight.ti,ab.
or/1-9
Child/ or Child, Preschool/ or Adolescent/ or Young Adult/
(child$ or teen or teens or teenag$ or adolescen$ or youth or youths or young people or young adult$ or pediatric$ or paediatric$ or schoolchildren or school children or preschool$ or pre school$ or toddler$).ti.
limit 13 to ("in data review" or in process or "pubmed not medline")
10 and (11 or 12 or 14)
Pediatric Obesity/
15 or 16
Mass screening/
Body constitution/
"Body Weights and Measures"/
Body Fat Distribution/
Adiposity/
Body Mass Index/
Skinfold thickness/
Body height/ and Body weight/
Waist circumference/
Waist-height ratio/
Anthropometry/
screen$.ti,ab.
body mass index$.ti,ab.
body mass indices.ti,ab.
bmi.ti,ab.
body mass abdominal index$.ti,ab.
body mass abdominal indices.ti,ab.
bmai.ti,ab.
body adiposity index$.ti,ab.
body adiposity indices.ti,ab.
(skinfold or skin fold).ti,ab.
waist circumference$.ti,ab.
waist to height ratio$.ti,ab.
waist height ratio$.ti,ab.
waist to hip ratio$.ti,ab.
weight for height.ti,ab.
height for weight.ti,ab.
weight for age.ti,ab.
weight stature.ti,ab.
(adiposity adj2 measur$).ti,ab.
anthropometr$.ti,ab.
17 and 50
Pediatric Obesity/di [Diagnosis]
Obesity/di
Obesity, Morbid/di
Obesity, Abdominal/di
Overweight/di
53 or 54 or 55 or 56
57 and (11 or 12 or 14)
59 or 52 or 58
clinical trials as topic/ or controlled clinical trials as topic/ or randomized controlled trials as topic/ or meta-analysis as topic/
(clinical trial or controlled clinical trial or meta analysis or randomized controlled trial).pt.
Random$.ti,ab.
control groups/ or double-blind method/ or single-blind method/
clinical trial$.ti,ab.
controlled trial$.ti,ab.
meta analy$.ti,ab.
or/60-66
59 and 67
limit 68 to (english language and yr="2005 -Current")
remove duplicates from 69

Ovid Medline
Treatment trials

Database: Ovid MEDLINE(R) <1946 to February Week 1 2015>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 09, 2015>, Ovid MEDLINE(R) Daily Update <February 09, 2015>
Search Strategy:

Obesity/
Obesity, Morbid/
Obesity, Abdominal/
Overweight/
Weight Gain/
Weight Loss/
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cbt.ti,ab.
((lifestyle or life style) adj (chang$ or interven$ or modif$)).ti,ab.
counseling.ti,ab.
social$.support$.ti,ab.
(peer$ adj2 support$).ti,ab.
((child$ adj3 parent$) and therap$).ti,ab.
(family intervention$ or parent$ intervention$).ti,ab.
(parent$ adj2 (behavior$ or involv$ or control$ or attitude$ or educat$)).ti,ab.
health education.ti,ab.
health promotion.ti,ab.
patient education.ti,ab.
nonpharmacologic intervention$.ti,ab.
non pharmacologic intervention$.ti,ab.
self regulat$.ti,ab.
(school$ adj5 (intervention$ or program$)).ti,ab.
or/25-62
Exercise/
Physical Conditioning, Human/
(exercise or physical activity).ti.
aerobic$.ti.
(fitness adj (class$ or regime$ or program$)).ti.
(physical training or physical education).ti.
(sedentary behavior$ adj3 reduc$).ti,ab.
((exercise or physical activity) adj5 (intervention$ or promot$)).ti,ab.
or/64-71
Diet-Fat-Restricted/
Diet-Reducing/
Diet, Carbohydrate-Restricted/
Diet-Therapy/
Caloric Restriction/
Food Habits/
(diet or diets or dieting or dietary).ti.
(diet$ adj (modif$ or therap$ or intervention$ or strateg$)).ti,ab.
(low calorie or calorie control$ or healthy eating).ti,ab.
formula diet$.ti,ab.
(formulawatcher$ or weight watcher$).ti,ab.
or/73-83
Case management/
Patient care team/
Cooperative behavior/
Interprofessional Relations/
Continuity of patient care/
Patient-centered care/
Patient care management/
Delivery of Health Care, Integrated/
collaborat$.ti,ab.

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Ovid Medline
Drug Treatment Harms

Database: Ovid MEDLINE(R) <1946 to February Week 1 2015>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <February 09, 2015>, Ovid MEDLINE(R) Daily Update <February 09, 2015>

Search Strategy:

1 Obesity/
2 Obesity, Morbid/
3 Obesity, Abdominal/
4 Overweight/
5 Weight Gain/
6 Weight Loss/
7 obesity.ti,ab.
8 obese.ti,ab.
9 overweight.ti,ab.
10 over weight.ti,ab.
11 (weight gain$ or weight loss$).ti,ab.
12 weight change$.ti,ab.
13 ((bmi or body mass ind$) adj2 (gain$ or loss$ or change$)).ti,ab.
14 weight maintenance.ti,ab.
15 weight control.ti,ab.
16 weight manag$.ti,ab.
17 or/1-16
18 Child/ or Child, Preschool/ or Adolescent/ or Young Adult/
19 (child$ or teen or teens or teenage$ or adolescent$ or youth or youths or young people or young adult$ or pediatric$ or paediatric$ or schoolchildren or school children or preschool$ or pre school$ or toddler$).ti.
20 (child$ or teen or teens or teenage$ or adolescent$ or youth or youths or young people or young adult$ or pediatric$ or paediatric$ or schoolchildren or school children or preschool$ or pre school$ or toddler$).ti,ab.
21 limit 20 to ("in data review" or in process or "pubmed not medline")
22 17 and (18 or 19 or 21)
23 Pediatric Obesity/
24 22 or 23
25 Anti-Obesity Agents/
26 Metformin/
27 Lactones/
28 Orlistat.ti,ab.
29 tetrahydrolipstatin.ti,ab.
30 Xenical.ti,ab.
31 Alli.ti,ab.
metformin.ti,ab.
Glucophage.ti,ab.
dimethylbiguanidine.ti,ab.
dimethylguanylguanidine.ti,ab.
(dimethylbiguanide or dimethyl-biguanide).ti,ab.
or/25-36
24 and 37
Pediatric Obesity/dt
Obesity/dt
Obesity, Morbid/dt
Obesity, Abdominal/dt
Overweight/dt
40 or 41 or 42 or 43
44 and (18 or 19 or 21)
38 or 39 or 45
"Drug-Related Side Effects and Adverse Reactions"/
safety.ti,ab.
harm$.ti,ab.
mortality.ti,ab.
toxicity.ti,ab.
complication$.ti,ab.
(death or deaths).ti,ab.
(adverse adj2 (interaction$ or response$ or effect$ or event$ or reaction$ or outcome$)).ti,ab.
adverse effects.fs.
toxicity.fs.
mortality.fs.
poisoning.fs.
quality of life/
depression/
depressive disorder
(depression or depressed).ti,ab.
stress, psychological/
adaptation, psychological/
anxiety/
(anxiety or anxious).ti,ab.
suicide/
(suicide$ or suicidal).ti,ab.
self concept/
self esteem.ti,ab.
body image/
social isolation/
False Positive Reactions/
Social stigma/
stigma$.ti,ab.
(label or labeled or labeling).ti,ab.
Patient Compliance/
Patient Acceptance of Health Care/
Patient Participation/
Treatment Refusal/
Patient Dropouts/
Eating Disorders/
Anorexia/
Anorexia Nervosa/
Bulimia/
Bulimia Nervosa/
eating disorder$.ti,ab.
disordered eating.ti,ab.
(anorexic or anorexia).ti,ab.
(bulimic or bulimia).ti,ab.
weight cycling.ti,ab.
weight fluctuat$.ti,ab.
fasting/
laxative$.ti,ab.
(overweight adj4 concern$).ti,ab.
(weight adj4 concern$).ti,ab.
((stunt$ or suppress$) adj2 growth).ti,ab.
Nausea/
Vomiting/
(nausea$ or nauseous or vomit$).ti,ab.
Diarrhea/
diarrh?ea.ti,ab.
Malnutrition/
(malnourished or malnutrition).ti,ab.
nutritional defici$.ti,ab.
or/47-105
46 and 106
limit 107 to (english language and yr="2010 -Current")
remove duplicates from 108

PsycINFO
Screening
Database: PsycINFO <1806 to February Week 1 2015>
Search Strategy:

1 Obesity/
2 Overweight/
3 Weight gain/
4 obesity.ti,ab,id.
5 obese.ti,ab,id.
6 overweight.ti,ab,id.
7 over weight.ti,ab,id.
weight gain.ti,ab,id.
1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
limit 9 to (100 childhood <birth to age 12 yrs> or 160 preschool age <age 2 to 5 yrs> or 180 school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs>)
(child$ or teen or teens or teenage$ or adolescent$ or youth or youths or young people or young adult$ or pediatric$ or paediatric$ or schoolchildren or school children or preschool$ or preschool$ or toddler$).ti,ab,id.
9 and 11
10 or 12
Screening/
Health screening/
Body mass index/
Body fat/
Body weight/
Anthropometry/
screen$.ti,ab,id.
bmi.ti,ab,id.
bmi.ti,ab,id.
body mass index$.ti,ab,id.
body mass indices.ti,ab,id.
bma.ti,ab,id.
body mass abdominal index$.ti,ab,id.
body mass abdominal indices.ti,ab,id.
body adiposity index$.ti,ab,id.
body adiposity indices.ti,ab,id.
(skinfold or skin fold).ti,ab,id.
waist circumference$.ti,ab,id.
wsi,ab,id.
wsi,ab,id.
waist to height ratio$.ti,ab,id.
wsi,ab,id.
waist to hip ratio$.ti,ab,id.
wsi,ab,id.
weight for height.ti,ab,id.
height for weight.ti,ab,id.
weight for age.ti,ab,id.
weight stature.ti,ab,id.
(adiposity adj2 measur$).ti,ab,id.
anthropometr$.ti,ab,id.
or/14-40
13 and 41
random$.ti,ab,id,hw.
placebo$.ti,ab,hw,id.
controlled trial$.ti,ab,id,hw.
clinical trial$.ti,ab,id,hw.
meta analy$.ti,ab,hw,id.
treatment outcome clinical trial.md.
43 or 44 or 45 or 46 or 47 or 48
42 and 49
PsycInfo
Treatment
Database: PsycINFO <1806 to February Week 1 2015>
Search Strategy:

--------------------------------------------------------------------------------
1     Obesity/
2     Overweight/
3     Weight gain/
4     Weight Control/
5     Weight Loss/
6     obesity.ti,ab,id.
7     obese.ti,ab,id.
8     overweight.ti,ab,id.
9     over weight.ti,ab,id.
10    weight gain.ti,ab,id.
11    weight loss.ti,ab,id.
12    weight maintenance.ti,ab,id.
13    weight control.ti,ab,id.
14    (weight adj3 manag$).ti,ab,id.
15    weight change$.ti,ab,id.
16    ((bmi or body mass ind$) adj2 (gain$ or loss$ or change$)).ti,ab,id.
17    or/1-16
18    limit 17 to (100 childhood <birth to age 12 yrs> or 160 preschool age <age 2 to 5 yrs> or
19    school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs>)
20    (child$ or teen or teens or teenager$ or adolescent$ or youth or youths or young people or
21    young adult$ or pediatric$ or paediatric$ or schoolchildren or school children or preschool$ or
22    pre school$ or toddler$).ti,ab,id.
23    17 and 19
24    18 or 20
25    Counseling/
26    Behavior Therapy/
27    Cognitive Behavior Therapy/
28    Cognitive Therapy/
29    Cognitive Techniques/
30    Behavior Modification/
31    Behavior Change/
32    Lifestyle Changes/
33    Lifestyle/
34    School Counseling/
35    Psychotherapeutic Counseling/
36    Peer Counseling/
37    Group Counseling/
38    Community Counseling/

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School Counseling/
Motivational Interviewing/
Feedback/
Biofeedback/
Health Education/
Health Promotion/
Client Education/
Self Regulation/
Intervention/
School Based Intervention/
Family Intervention/
Early Intervention/
((psychological or behavior$) adj (therap$ or modif$ or chang$ or strateg$ or intervention$)).ti,ab,id.
(group therap$ or family therap$ or cognitive therap$).ti,ab,id.
cbt.ti,ab.id.
((lifestyle or life style) adj (chang$ or interven$ or modifi$)).ti,ab,id.
counsel$.ti,ab.id.
social$ support$.ti,ab.id.
(peer adj2 support).ti,ab,id.
((child$ adj3 parent$) and therapy).ti,ab,id.
(family intervention$ or parent$ intervention$).ti,ab,id.
(parent$ adj2 (behavior$ or involv$ or control$ or attitude$ or educat$)).ti,ab.
health education.ti,ab,id.
health promotion.ti,ab,id.
patient education.ti,ab,id.
nonpharmacologic intervention$.ti,ab,id.
non pharmacologic intervention$.ti,ab,id.
self regulat$.ti,ab.id.
(school$ adj5 (intervention$ or program$)).ti,ab,id.
or/22-64
Physical Activity/
Physical Fitness/
Exercise/
Aerobic Exercise/
Active Living/
(exercise or physical activity).ti.
aerobic$.ti.
(fitness adj (class$ or regime$ or program$)).ti.
(physical training or physical education).ti.
(sedentary behavior$ adj3 reduc$).ti,ab,id.
((exercise or physical activity) adj5 (intervention$ or promot$)).ti,ab,id.
or/66-76
Diets/
Dietary Restraint/
Food Intake/

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Eating Behavior/
(diet or diets or dieting or dietary).ti.
(diet$ adj (modif$ or therapy or intervention$ or strateg$)).ti,ab,id.
(low calorie or calorie control$ or healthy eating).ti,ab,id.
formula diet$.ti,ab,id.
(weightwatcher$ or weight watcher$).ti,ab,id.
or/78-86

Interdisciplinary Treatment Approach/
Collaboration/
Cooperation/
Case Management/
Work Teams/
Community Mental Health Services/
Health Care Delivery/
Community Psychology/
Community Psychiatry/
collaborat$.ti,ab,id.
(interdisciplinary or inter disciplinary).ti,ab,id.
(multidisciplinary or multi disciplinary).ti,ab,id.
(integrated adj5 (healthcare or care)).ti,ab,id.
care manag$.ti,ab,id.
case manag$.ti,ab,id.
cooperative care.ti,ab,id.
coordinated care.ti,ab,id.
patient centered care.ti,ab,id.
or/88-105
((weight loss or weight reduction or weight control or weight maintenance or weight management) adj3 (intervention$ or promot$)).ti,ab,id.
21 and (65 or 77 or 87 or 106 or 107)
random$.ti,ab,id,hw.
placebo$.ti,ab,hw,id.
controlled trial$.ti,ab,id,hw.
clinical trial$.ti,ab,id,hw.
meta analy$.ti,ab,hw,id.
treatment outcome clinical trial.md.
or/109-114
108 and 115
Orlistat.ti,ab,id.
tetrahydrolipstatin.ti,ab,id.
Xenical.ti,ab,id.
Alli.ti,ab,id.
metformin.ti,ab,id.
Glucophage.ti,ab,id.
dimethylbiguanidine.ti,ab,id.
dimethylguanylguanidine.ti,ab,id.
(dimethylbiguanide or dimethyl-biguanide).ti,ab,id.
126  or/117-125
127  21 and 126
128  116 or 127
129  limit 128 to (english language and yr="2010 -Current")

## Pubmed, publisher-supplied

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eTable 1. Quality Assessment Criteria

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Adapted Quality Criteria</th>
</tr>
</thead>
</table>
| Randomized and non-randomized controlled trials, adapted from the U.S. Preventive Services Task Force methods¹ | • Valid random assignment?  
• Was allocation concealed?  
• Was eligibility criteria specified?  
• Were groups similar at baseline?  
• Was there a difference in attrition between groups?  
• Were outcome assessors blinded?  
• Were measurements equal, valid and reliable?  
• Was there intervention fidelity?  
• Was there risk of contamination?  
• Was there adequate adherence to the intervention?  
• Were the statistical methods acceptable?  
• Was the handling of missing data appropriate?  
• Was there acceptable followup?  
• Was there evidence of selective reporting of outcomes? |

Good quality studies generally meet all quality criteria. Fair quality studies do not meet all the criteria but do not have critical limitations that could invalidate study findings. Poor quality studies have a single fatal flaw or multiple important limitations that could invalidate study findings. Critical appraisal of studies using a priori quality criteria are conducted independently by at least two reviewers. Disagreements in final quality assessment are resolved by consensus, and, if needed, consultation with a third independent reviewer.
Table 2. Summary of 59 Treatment Trials Grouped by Intervention Type and Sorted by Descending Estimated Intervention Contact Hours (Key Questions 3-5)

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Quality</th>
<th>Study design</th>
<th>Country</th>
<th>Setting</th>
<th>No. Randomized</th>
<th>Months F/U (% F/U 12 months or closest *)</th>
<th>Population</th>
<th>Intervention</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lison, 2012&lt;sup&gt;58&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>Spain</td>
<td>Health Care</td>
<td>110</td>
<td>6 (76.4)</td>
<td>6- to 16-year-old Caucasians who are overweight or have obesity (≥85th percentile but zBMI ≤2.5 for age and sex [IOTF])</td>
<td>Hospital-based group exercise</td>
<td>122</td>
<td>Lifestyle instruction during regular visits</td>
</tr>
<tr>
<td>Weigel, 2008&lt;sup&gt;86&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>Germany</td>
<td>Other</td>
<td>73</td>
<td>6; 12 (90.4)</td>
<td>7- to 15-year-olds with obesity (&gt;97th percentile [German norms])</td>
<td>Sea Lion Club</td>
<td>114.1</td>
<td>Brief advice</td>
</tr>
<tr>
<td>Savoye, 2007&lt;sup&gt;24,96&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>209</td>
<td>6; 12 (68.4)</td>
<td>8- to 16-year-olds with obesity (BMI &gt; 95th percentile [CDC])</td>
<td>Bright Bodies</td>
<td>82.33</td>
<td>Semi-annual individual counseling</td>
</tr>
<tr>
<td>Savoye, 2014&lt;sup&gt;93,100&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>75</td>
<td>6 (77.3)</td>
<td>10- to 16-year-olds with obesity (BMI &gt; 95th percentile [CDC])</td>
<td>Bright Bodies</td>
<td>78</td>
<td>General advice + brief psychosocial counseling</td>
</tr>
<tr>
<td>Reinehr, 2006&lt;sup&gt;47,101&lt;/sup&gt;</td>
<td>Fair</td>
<td>CCT</td>
<td>Germany</td>
<td>Health Care</td>
<td>240</td>
<td>12; 24 (87.9)</td>
<td>6- to 14-year-olds with obesity (BMI ≥97th percentile [German norms])</td>
<td>Obeldicks</td>
<td>77.5</td>
<td>Distance control</td>
</tr>
<tr>
<td>Reinehr, 2009&lt;sup&gt;78&lt;/sup&gt;</td>
<td>Fair</td>
<td>CCT</td>
<td>Germany</td>
<td>Health Care</td>
<td>474</td>
<td>12 (100)</td>
<td>10- to 16-year-olds with obesity (minimum BMI NR [German norms])</td>
<td>Obeldicks</td>
<td>77.5</td>
<td>Distance control</td>
</tr>
<tr>
<td>Reinehr, 2010&lt;sup&gt;96,102&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>Germany</td>
<td>Health Care</td>
<td>71</td>
<td>6 (84.5)</td>
<td>8- to 16-year-olds who are overweight (BMI 90th to 97th percentile [German norms])</td>
<td>Obeldicks light</td>
<td>67</td>
<td>Waitlist</td>
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<table>
<thead>
<tr>
<th>Author, Year</th>
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<th>Population</th>
<th>Interventio n</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
</tr>
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<tbody>
<tr>
<td>Vos, 2011&lt;sup&gt;63,103&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>Netherlands</td>
<td>Health Care</td>
<td>81</td>
<td>12 (82.7)</td>
<td>8- to 17-year-olds with obesity (IOTF)</td>
<td>Family-based multi-disciplinary lifestyle intervention</td>
<td>46.25</td>
<td>Waitlist</td>
</tr>
<tr>
<td>Kalarchia n, 2009&lt;sup&gt;35,105&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>192</td>
<td>6;12;18 (72.4)</td>
<td>8- to 12-year-olds with severe obesity (BMI ≥97th percentile [CDC])</td>
<td>Family-based lifestyle intervention</td>
<td>43.75</td>
<td>Nutrition consultation</td>
</tr>
<tr>
<td>Kalavaine n, 2007&lt;sup&gt;36,106&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>Finland</td>
<td>Health Care</td>
<td>70</td>
<td>12 (98.6)</td>
<td>7- to 9-year-olds with obesity (weight for height 120-200% of median [UK norms])</td>
<td>Health-promoting lifestyle</td>
<td>43.5</td>
<td>Brief education + booklets</td>
</tr>
<tr>
<td>Stark, 2011&lt;sup&gt;56&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Primary Care and Home</td>
<td>18</td>
<td>6; 12 (88.9)</td>
<td>2- to 5-year-olds with at least 1 overweight parent and who have obesity (≥95th BMI percentile but &lt;100% above mean BMI [CDC])</td>
<td>LAUNCH</td>
<td>38.25</td>
<td>Enhanced standard of care</td>
</tr>
<tr>
<td>Croker, 2012&lt;sup&gt;28&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United Kingdom</td>
<td>Health Care</td>
<td>72</td>
<td>6 (68.1)</td>
<td>8- to 12-year-olds who are overweight or have obesity (IOTF)</td>
<td>Family-based behavioral therapy</td>
<td>37.5</td>
<td>Waitlist</td>
</tr>
<tr>
<td>DeBar, 2012&lt;sup&gt;31&lt;/sup&gt;</td>
<td>Good</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>208</td>
<td>6; 12 (83.2)</td>
<td>12- to 17-year-old females who are overweight or have obesity (BMI ≥90th percentile [CDC])</td>
<td>Multi-component behavioral intervention</td>
<td>36.5</td>
<td>PCP meeting + materials</td>
</tr>
<tr>
<td>Sacher, 2010&lt;sup&gt;31&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United Kingdom</td>
<td>Other</td>
<td>116</td>
<td>6 (70.7)</td>
<td>8- to 12-year-olds with obesity (BMI ≥98th percentile [UK 1990 reference norms])</td>
<td>MEND</td>
<td>36</td>
<td>Waitlist</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Quality</td>
<td>Study design</td>
<td>Country</td>
<td>Setting</td>
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<td>Months F/U (% F/U 12 months or closest *)</td>
<td>Population</td>
<td>Intervention</td>
<td>Estimated hours of contact</td>
<td>Control group</td>
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<td>Nemet, 2005</td>
<td>Fair</td>
<td>RCT</td>
<td>Israel</td>
<td>Health Care</td>
<td>54</td>
<td>12 (74.1)</td>
<td>6- to 16-year-olds with obesity (definition NR)</td>
<td>Dietician + physical activity sessions</td>
<td>32.5</td>
<td>Nutrition referral</td>
</tr>
<tr>
<td>Stark, 2014</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>27</td>
<td>6; 12 (85.2)</td>
<td>2- to 5-year-olds with at least 1 overweight parent and who have obesity (≥95th BMI percentile but &lt;100% above mean BMI [CDC])</td>
<td>LAUNCH-clinic</td>
<td>30</td>
<td>Enhanced standard of care</td>
</tr>
<tr>
<td>Bryant, 2011</td>
<td>Fair</td>
<td>RCT</td>
<td>United Kingdom</td>
<td>Other</td>
<td>70</td>
<td>12 (75.7)</td>
<td>8- to 16-year-olds with obesity (BMI ≥98th percentile, [NR])</td>
<td>WATCH IT</td>
<td>24</td>
<td>Waitlist</td>
</tr>
<tr>
<td>Mellin, 1987</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>66</td>
<td>6 (95.5)</td>
<td>12- to 18-year-olds with obesity (definition NR)</td>
<td>SHAPED OWN</td>
<td>24</td>
<td>Waitlist</td>
</tr>
<tr>
<td>Golley, 2007</td>
<td>Fair</td>
<td>RCT</td>
<td>Australia</td>
<td>Health Care</td>
<td>111</td>
<td>12 (82.0)</td>
<td>6- to 9-year-olds who are overweight or have obesity, but zBMI ≤3.5 (IOTF)</td>
<td>Triple P + healthy lifestyle group</td>
<td>23.75</td>
<td>Waitlist</td>
</tr>
<tr>
<td>Hofsteen, 2014</td>
<td>Fair</td>
<td>RCT</td>
<td>Netherlands</td>
<td>Health Care</td>
<td>122</td>
<td>6 (79.5)</td>
<td>11- to 18-year-olds who are overweight or have obesity (Dutch norms)</td>
<td>Go4it</td>
<td>16.5</td>
<td>Usual care X</td>
</tr>
<tr>
<td>Gerards, 2015</td>
<td>Fair</td>
<td>RCT</td>
<td>Netherlands</td>
<td>Primary Care</td>
<td>86</td>
<td>12 (77.9)</td>
<td>4- to 8-year-olds who are overweight or have obesity (IOTF)</td>
<td>Lifestyle Triple P</td>
<td>16.5</td>
<td>Control X</td>
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<tr>
<td>Nowicka, 2008</td>
<td>Fair</td>
<td>CCT</td>
<td>Sweden</td>
<td>Health Care</td>
<td>95</td>
<td>12 (92.6)</td>
<td>12- to 19-year-olds with obesity (IOTF)</td>
<td>Family Weight School</td>
<td>16</td>
<td>Waitlist X</td>
</tr>
<tr>
<td>Boudreau, 2013</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>41</td>
<td>6 (63.4)</td>
<td>9- to 12-year-old Latinos who are overweight or had obesity (BMI ≥85th percentile [CDC])</td>
<td>PowerUp + coaching</td>
<td>10.5</td>
<td>Waitlist X</td>
</tr>
<tr>
<td>Norman, 2015</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>106</td>
<td>8; 12 (80.2)</td>
<td>11- to 13-year-olds with obesity (BMI ≥95 percentile for age and gender [CDC])</td>
<td>Stepped-down care</td>
<td>8.25</td>
<td>Enhanced usual care</td>
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<table>
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<tr>
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<th>Interventio n</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
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<td>Taylor, 2015**</td>
<td>Good</td>
<td>RCT</td>
<td>New Zealand</td>
<td>University and home</td>
<td>206</td>
<td>12; 24 (87.9)</td>
<td>4- to 8-years-old who are overweight or have obesity (BMI ≥85th percentile [CDC])</td>
<td>Tailored lifestyle support</td>
<td>7.2</td>
<td>Brief feedback and advice</td>
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<td>Raynor, 2012a</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Other</td>
<td>101</td>
<td>6; 12 (89.1)</td>
<td>4- to 9-year-olds who are overweight or have obesity (≥85th BMI percentile [CDC])</td>
<td>DECREASE + growth monitoring</td>
<td>6</td>
<td>Monthly newsletters + growth monitoring</td>
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<tr>
<td>Raynor, 2012b</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Other</td>
<td>81</td>
<td>6; 12 (91.4)</td>
<td>4- to 9-year-olds who are overweight or have obesity (≥85th BMI percentile [CDC])</td>
<td>TRADITIONAL + growth monitoring</td>
<td>6</td>
<td>Monthly newsletters + growth monitoring</td>
</tr>
<tr>
<td>Kong, 2013?</td>
<td>Fair</td>
<td>Single group cluster RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>60</td>
<td>6 (85.0)</td>
<td>Students in 9th to 11th grades who are overweight or have obesity (BMI ≥85th percentile [CDC])</td>
<td>ACTION</td>
<td>4.25</td>
<td>Single PCP visit + booklet</td>
</tr>
<tr>
<td>Stettler, 2014?</td>
<td>Fair</td>
<td>Cluster RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>173</td>
<td>6; 12; 24 (69.9)</td>
<td>8- to 12-year-olds who are overweight (75th to 95th percentile [CDC]) and consuming average of ≥4 ounces of sugar sweetened beverages/day</td>
<td>Multiple-behavior change</td>
<td>4</td>
<td>Attention control (bullying prevention)</td>
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<tr>
<td>Saelens, 2002??</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>44</td>
<td>7 (84.1)</td>
<td>12- to 1-year-olds who are overweight or have obesity (20% to 100% above median for BMI [NHANES])</td>
<td>Healthy Habits intervention</td>
<td>3.75</td>
<td>Single pediatrician session</td>
</tr>
<tr>
<td>Broccoli, 2016??</td>
<td>Good</td>
<td>RCT</td>
<td>Italy</td>
<td>Primary Care</td>
<td>372</td>
<td>12 (95.4)</td>
<td>4- to 7-year-olds who are overweight (85th to 95th BMI percentile [CDC])</td>
<td>MI</td>
<td>3.75</td>
<td>Obesity prevention booklet</td>
</tr>
<tr>
<td>O'Connor, 2013?</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>40</td>
<td>7 (85)</td>
<td>5- to 8-year-olds who are overweight or have obesity (BMI 85th to 98th percentile [CDC])</td>
<td>Helping HAND</td>
<td>3.5</td>
<td>Waitlist</td>
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<th>Estimated hours of contact</th>
<th>Control group</th>
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<tbody>
<tr>
<td>Sherwood, 2015⁵⁸</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>60</td>
<td>6 (91.7)</td>
<td>2- to 4-year-olds at risk for obesity (50th to 85th BMI percentile [CDC 2000] with 1 parent who is overweight) or who is overweight (85th to 95th BMI percentile [CDC 2000])</td>
<td>Busy Bodies / Better Bites</td>
<td>3.32</td>
<td>Attention control (safety education) X</td>
</tr>
<tr>
<td>Taveras, 2011⁷⁹,¹²⁰</td>
<td>Good Cluster RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>475</td>
<td>12; 24 (93.7)</td>
<td>2- to 6-year-olds who are overweight (≥85th percentile [CDC]) and have an overweight parent (BMI ≥25), or are obese (≥95th percentile)</td>
<td>MI + enhanced electronic medical record and training</td>
<td>2.67</td>
<td>Usual care X</td>
<td></td>
</tr>
<tr>
<td>Love-Osborne, 2014⁴⁰,¹²³</td>
<td>Fair RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>165</td>
<td>8 (90.3)</td>
<td>Middle and high school students at schools with high percentages of underserved, largely ethnic minority students who are overweight or have obesity (BMI ≥85th percentile [norms NR])</td>
<td>Health educator visits</td>
<td>2.5</td>
<td>Physical exam and lab screening if due; followup as needed X</td>
<td></td>
</tr>
<tr>
<td>Looney, 2014⁴⁹</td>
<td>Fair RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>22</td>
<td>6 (95)</td>
<td>4- to 10-year-olds who are overweight or have obesity (≥85th percentile [CDC])</td>
<td>Newsletters + growth monitorin g + family-based behavioral counselin g</td>
<td>2.5</td>
<td>Newsletters X</td>
<td></td>
</tr>
<tr>
<td>Resnicow, 2015⁵⁰,¹²⁴</td>
<td>Fair Cluster RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>645</td>
<td>24 (70.9)</td>
<td>2- to 8-year-olds who are overweight or have obesity (BMI 85th to 97th percentile [CDC])</td>
<td>PCP + registered dietitian + MI</td>
<td>2.5</td>
<td>Usual care X</td>
<td></td>
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<th>Population</th>
<th>Interventions</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
<th>KO 3</th>
<th>KO 4</th>
<th>KO 5</th>
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</thead>
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<tr>
<td>Wake, 2013</td>
<td>Good</td>
<td>RCT</td>
<td>Australia</td>
<td>Health Care</td>
<td>118</td>
<td>12 (90.7)</td>
<td>3- to 10-year-olds with obesity (≥95th percentile [CDC])</td>
<td>HopSCOT CH</td>
<td>2.5</td>
<td>Usual care</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Van Grieken, 2013</td>
<td>Fair</td>
<td>Cluster RCT</td>
<td>Netherlands</td>
<td>Primary Care</td>
<td>637</td>
<td>24 (79.6)</td>
<td>5-year-olds who are overweight but do not have obesity (IOTF)</td>
<td>Be Active Eat Right</td>
<td>2</td>
<td>Usual care</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taveras, 2015</td>
<td>Good</td>
<td>Cluster RCT</td>
<td>United States</td>
<td>Primary Care</td>
<td>549</td>
<td>12 (94.4)</td>
<td>6- to 12-years-olds with obesity (≥95th percentile [CDC])</td>
<td>Clinical decision support + coaching</td>
<td>1.25</td>
<td>Usual care</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McCallum, 2007</td>
<td>Good</td>
<td>RCT</td>
<td>Australia</td>
<td>Primary Care</td>
<td>163</td>
<td>9.1; 15.0 (89.6)</td>
<td>5- to 9-year-olds who are overweight or have mild obesity (IOTF but zBMI &lt;3.0)</td>
<td>LEAP</td>
<td>1</td>
<td>Usual care</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Wake, 2009</td>
<td>Good</td>
<td>RCT</td>
<td>Australia</td>
<td>Primary Care</td>
<td>258</td>
<td>6; 12 (95.0)</td>
<td>5- to 10-year-olds who are overweight or have obesity but zBMI &lt;3.0 (IOTF and UK norms)</td>
<td>LEAP-2</td>
<td>1</td>
<td>Usual care</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### Lifestyle-based Maintenance After Weight Loss Interventions

| Davis, 2012 | Fair | RCT | United States | Other | 61 | 8 (86.9) | Adolescent African Americans or Latinos in grades 9 through 12 who had completed initial 4-month weight loss intervention and are overweight or have obesity (≥85th percentile [CDC]) | Maintenance (group classes) | 16 (14) | Newsletters | X  |

### Non-Lifestyle Behavior-based Interventions

| Boutelle, 2014 | Fair | RCT | United States | Other | 44 | 8 (88.6) | 8- to 12-year-olds meeting criteria for eating in the absence of hunger who are overweight or had obesity (≥85th percentile [CDC]) | Regulation of Cues (ROC) program | 28 (14) | Waitlist | X  |

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<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Quali ty</th>
<th>Study design</th>
<th>Country</th>
<th>Setting</th>
<th>No. Randomized</th>
<th>Months F/U (% F/U 12 months or closest *)</th>
<th>Population</th>
<th>Interventio n</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanofsky-Kraff, 2010</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Other</td>
<td>38</td>
<td>6; 12 (92.1)</td>
<td>Adolescent girls who are overweight or have obesity (BMI 75th to 97th percentile [norms NR])</td>
<td>Interpersonal therapy + weight gain prevention</td>
<td>17.9 (13)</td>
<td>Attention control (health education)</td>
</tr>
<tr>
<td>Clarson, 2014</td>
<td>Fair</td>
<td>RCT</td>
<td>Canada</td>
<td>Health Care</td>
<td>69</td>
<td>6; 12; 24 (68.1)</td>
<td>10- to 16-year-olds with obesity (BMI &gt;95th percentile for age and sex [CDC])</td>
<td>Metformin + comprehensive lifestyle</td>
<td>86</td>
<td>Placebo + comprehensive lifestyle intervention</td>
</tr>
<tr>
<td>Wiegand, 2010</td>
<td>Fair</td>
<td>RCT</td>
<td>Germany and Switzerland</td>
<td>Health Care</td>
<td>70</td>
<td>6 (90)</td>
<td>10- to 17-year-olds with obesity (&gt;97th percentile [German norms]) at risk of developing type 2 diabetes with previous unsuccessful lifestyle intervention</td>
<td>Metformin + family-based lifestyle intervention</td>
<td>40.8</td>
<td>Placebo + lifestyle intervention</td>
</tr>
<tr>
<td>Wilson, 2010</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>77</td>
<td>12 (70.1)</td>
<td>13- to 18-year-olds with obesity (BMI ≥95th percentile [CDC]) but weight &lt;136 kg</td>
<td>Metformin + lifestyle intervention</td>
<td>9.5</td>
<td>Placebo + lifestyle intervention</td>
</tr>
<tr>
<td>Yanovski, 2011</td>
<td>Good</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>100</td>
<td>6 (85)</td>
<td>6- to 12-year-olds with insulin resistance and obesity (BMI ≥95th percentile [CDC])</td>
<td>Metformin + lifestyle intervention</td>
<td>3</td>
<td>Placebo + lifestyle intervention</td>
</tr>
<tr>
<td>Love-Osborne, 2008</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Other</td>
<td>85</td>
<td>6 (75.3)</td>
<td>12- to 19-year-olds with insulin resistance or presence of acanthosis nigricans and obesity (BMI &gt;95 percentile [norms NR])</td>
<td>Metformin + goal setting</td>
<td>2.25</td>
<td>Placebo + goal setting</td>
</tr>
<tr>
<td>Kay, 2001</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>NR</td>
<td>24</td>
<td>2 (NR)</td>
<td>Adolescents with obesity (BMI &gt;30 [NR])</td>
<td>Metformin + calorie-controlled diet</td>
<td>0.5</td>
<td>Placebo + calorie-controlled diet</td>
</tr>
</tbody>
</table>

**Pharmacotherapy: Metformin**

| Clarson, 2014 | Fair | RCT | Canada | Health Care | 69 | 6; 12; 24 (68.1) | 10- to 16-year-olds with obesity (BMI >95th percentile for age and sex [CDC]) | Metformin + comprehensive lifestyle | 86 | Placebo + comprehensive lifestyle intervention | X X |
| Wiegand, 2010 | Fair | RCT | Germany and Switzerland | Health Care | 70 | 6 (90) | 10- to 17-year-olds with obesity (>97th percentile [German norms]) at risk of developing type 2 diabetes with previous unsuccessful lifestyle intervention | Metformin + family-based lifestyle intervention | 40.8 | Placebo + lifestyle intervention | X X |
| Wilson, 2010 | Fair | RCT | United States | Health Care | 77 | 12 (70.1) | 13- to 18-year-olds with obesity (BMI ≥95th percentile [CDC]) but weight <136 kg | Metformin + lifestyle intervention | 9.5 | Placebo + lifestyle intervention | X X |
| Yanovski, 2011 | Good | RCT | United States | Health Care | 100 | 6 (85) | 6- to 12-year-olds with insulin resistance and obesity (BMI ≥95th percentile [CDC]) | Metformin + lifestyle intervention | 3 | Placebo + lifestyle intervention | X X |

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<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Quality</th>
<th>Study Design</th>
<th>Country</th>
<th>Setting</th>
<th>No. Randomized</th>
<th>Months F/U (% F/U 12 months or closest *)</th>
<th>Population</th>
<th>Intervention</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evia-Viscarra, 2012</td>
<td>Fair</td>
<td>RCT</td>
<td>Mexico</td>
<td>Health Care</td>
<td>31</td>
<td>3 (83.9)</td>
<td>9- to 18-year-olds with insulin resistance and obesity (BMI &gt;95th percentile for age and sex [CDC])</td>
<td>Metformin + lifestyle recommendations</td>
<td>0.25</td>
<td>Placebo + lifestyle recommendations</td>
</tr>
<tr>
<td>Kendall, 2013</td>
<td>Fair</td>
<td>RCT</td>
<td>United Kingdom</td>
<td>Health Care</td>
<td>155</td>
<td>6 (71.0)</td>
<td>8- to 18-year-olds with impaired glucose tolerance or hyperinsulinemia and obesity (BMI &gt;98th percentile [UK norms])</td>
<td>Metformin + 1 individual session</td>
<td>0.25</td>
<td>Placebo + 1 individual session</td>
</tr>
<tr>
<td>Srinivasa, 2006</td>
<td>Fair</td>
<td>RCT</td>
<td>Australia</td>
<td>Health Care</td>
<td>28</td>
<td>6 (78.6)</td>
<td>9- to 18-year-olds with clinical suspicion of insulin resistance or presence of acanthosis nigricans and obesity (IOTF)</td>
<td>Metformin + 1 individual session</td>
<td>0.25</td>
<td>Placebo</td>
</tr>
<tr>
<td>Burgert, 2008</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>34</td>
<td>4 (82.4)</td>
<td>13- to 18-years-old with insulin resistance and obesity [NR]</td>
<td>Metformin + lifestyle recommendations</td>
<td>0.25</td>
<td>Placebo + lifestyle recommendations</td>
</tr>
<tr>
<td>Freemark, 2001</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>32</td>
<td>6 (90.6)</td>
<td>12- to 19-year-olds with fasting hyperinsulinemia and family history of type II DM and obesity (BMI &gt;30)</td>
<td>Metformin</td>
<td>0</td>
<td>Placebo</td>
</tr>
<tr>
<td>Pharmacotherapy: Orlistat</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yanovski, 2012</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Health Care</td>
<td>200</td>
<td>6 (85.5)</td>
<td>12- to 17-year-old African Americans and Caucasians with severe obesity (BMI and triceps skinfold &gt;95th percentile [NHANES]) and ≥1 obesity-related comorbidity</td>
<td>Orlistat + behavioral weight loss</td>
<td>15</td>
<td>Placebo + behavioral weight loss</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Quality</th>
<th>Study design</th>
<th>Country</th>
<th>Setting</th>
<th>No. Randomized</th>
<th>Months F/U (% F/U 12 months or closest *)</th>
<th>Population</th>
<th>Intervention</th>
<th>Estimated hours of contact</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chanoine, 2005&lt;sup&gt;77,138&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United States and Canada</td>
<td>Health Care</td>
<td>539</td>
<td>12 (64.7)</td>
<td>12- to 16-year-olds with obesity (≥2 BMI units above U.S. mean for 95th percentile, and BMI&lt;44)</td>
<td>Orlistat + diet, physical activity, and behavior therapy</td>
<td>9</td>
<td>Placebo + diet, physical activity, and behavior therapy</td>
</tr>
<tr>
<td>Maahs, 2006&lt;sup&gt;78&lt;/sup&gt;</td>
<td>Fair</td>
<td>RCT</td>
<td>United States</td>
<td>Other</td>
<td>40</td>
<td>6 (85)</td>
<td>14- to 18-year-olds who are overweight or have obesity (BMI &gt;85th percentile [norms NR])</td>
<td>Orlistat + dietitian counseling</td>
<td>3.5</td>
<td>Placebo + dietitian counseling</td>
</tr>
</tbody>
</table>

Abbreviations: BMI = body mass index; CCT = controlled clinical trial; CDC = Centers for Disease Control and Prevention; F/U = follow-up; IOTF = International Obesity Task Force; KQ = Key Question; NHANES = National Health and Nutrition Examination Survey; NR = not reported; PCP = primary care physician; RCT = randomized controlled trial; UK = United Kingdom; zBMI = body mass index z-score

*If 12-month outcome was not available, we used the assessment point closest to 12 months that was available.

**The intervention for Taylor et al. was estimated at 6 hours over 24 months, but only 5 hours in the first 12 months. Therefore it is included in the group of trials with <6 hours in the meta-analysis and when the main (12-month) outcomes are discussed.
### Table 3. Intervention Characteristics of 56 Trials Included for Treatment Benefit (Key Questions 3-5)

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Description</th>
<th>Format</th>
<th>Target</th>
<th>No. Sessions</th>
<th>Session length (minutes)</th>
<th>Duration (months)</th>
<th>Estimated hours</th>
<th>Clinician Role or PCP</th>
</tr>
</thead>
</table>
| Lison, 2012<sup>36</sup> | Hospital-based group exercise (IG1): Two 1-hour parent/child lifestyle education sessions with behavior change strategies; 120 1-hour group PA sessions (offered 5 times/week, families encouraged to attend at least 3 sessions/week) | Group | X | Child, family | 122 | NR | 6 | 122 | Pediatrician (education sessions), PE instructor (exercise sessions)  
PCP: No role |
| | Home-based exercise (IG2): Two 1-hour parent/child lifestyle education sessions with behavior change strategies and Mediterranean diet focus; detailed home-based PA plan with demonstration, written instructions, and log | Individual | X | Child, family | 2 | 60 | 6 | 2 | Pediatrician (education sessions), physical education instructor (assumed, exercise demonstration)  
PCP: No role |
| Weigel, 2008<sup>46</sup> | Twice weekly 45- to 60-minute child group sessions for 12 months, including PA, dietary education, and coping strategies; 12 separate monthly 2-hour parent support meetings that included some parent-child activities | Group | X | Parent, child, family | 104 | 45-60 (child), 120 (parent) | 12 | 114.1 | Dietitians, psychologists, sports coaches  
PCP: No role |
| Savoye, 2007<sup>24</sup> | Twenty six weekly nutrition education and behavioral management sessions using Smart Moves Workbook, twice-weekly PA sessions tapering to twice-monthly after 6 months | Group | X | Parent, child, family | 64 | 40 (diet + behavior), 50 (PA, 1st 6 months), 100 (PA, 2nd 6 months) | 12 | 82, 33 | Dietitian or social worker; exercise physiologists  
PCP: No role |
<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Description</th>
<th>Format</th>
<th>Target</th>
<th>No. Sessions</th>
<th>Session length (minutes)</th>
<th>Duration (months)</th>
<th>Estimated hours</th>
<th>Clinician Role or PCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savoye, 2014</td>
<td>Twenty six weekly nutrition education and behavioral management sessions using Smart Moves Workbook; twice-weekly PA sessions tapering to twice-monthly after 6 months; 26 parent support sessions</td>
<td>Group X</td>
<td>Parent, child, family</td>
<td>52</td>
<td>50 (exercise), 40 (therapy)</td>
<td>6</td>
<td>78</td>
<td>Dietitian, physical therapist PCP: No role</td>
</tr>
<tr>
<td>Reinehr, 2006</td>
<td>Intensive year-long comprehensive program; 9-session parent group course, 6-session behavior therapy and nutrition education groups for children, weekly PA sessions, 6 individual family therapy sessions (more as needed)</td>
<td>Group, Individual X</td>
<td>Parent, child, family</td>
<td>52</td>
<td>90 (group sessions), 30 (individual family), 60 (PA)</td>
<td>12</td>
<td>77, 5</td>
<td>Pediatrician, dietitian, psychologist, exercise physiologist PCP: No role</td>
</tr>
<tr>
<td>Reinehr, 2009</td>
<td>Intensive year-long comprehensive program; 9-session parent group course, 6-session behavior therapy and nutrition education groups for children, weekly PA sessions, 3 individual family therapy sessions (more as needed)</td>
<td>Group, Individual X</td>
<td>Parent, child, family</td>
<td>52</td>
<td>90 (group sessions), 30 (family), 60 (PA)</td>
<td>12</td>
<td>77, 5</td>
<td>Pediatricians, diet-assistants, psychologists, and exercise physiologists PCP: No role</td>
</tr>
<tr>
<td>Reinehr, 2010</td>
<td>Thirty seven child sessions, 6 parent sessions, 5 child + parent sessions; PA training, nutrition education, and behavior counseling performed in group sessions with individual counseling for child and family.</td>
<td>Group, Individual X</td>
<td>Parent, child, family</td>
<td>37</td>
<td>90 (PA), 90 parent; 30 individual child/parent counseling</td>
<td>6</td>
<td>67</td>
<td>Pediatricians, diet-assistants, psychologists, exercise physiologists PCP: No role</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
<td>Format</td>
<td>Target</td>
<td>No. Sessions</td>
<td>Session length (minutes)</td>
<td>Duration (months)</td>
<td>Estimated hours</td>
<td>Clinician Role or PCP</td>
</tr>
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</tr>
<tr>
<td>Vos, 2011&lt;sup&gt;34&lt;/sup&gt;</td>
<td>Two individual family assessment and advice visits followed by 7 2.5-hour group comprehensive behavioral lifestyle meetings; parents and children usually separate, plus 2 or 3 booster group sessions yearly</td>
<td>Group, Individual</td>
<td>Parent, child, family</td>
<td>19</td>
<td>150 (group), 180 to 270 (individual)</td>
<td>24</td>
<td>46, 25</td>
<td>Dietitian, child physiotherapist, child psychologist, social worker PCP: No role</td>
</tr>
<tr>
<td>Kalarchian, 2009&lt;sup&gt;35&lt;/sup&gt;</td>
<td>Twenty 60-minute separate adult and child group sessions, including weekly family meeting with lifestyle coach; adult also set goals, modeled behavior change; 6 booster sessions (3 group, 3 phone)</td>
<td>Group, Individual</td>
<td>Parent, child, family</td>
<td>26</td>
<td>60</td>
<td>12</td>
<td>43.75</td>
<td>Lifestyle coach PCP: No role</td>
</tr>
<tr>
<td>Kalavainen, 2007&lt;sup&gt;36&lt;/sup&gt;</td>
<td>15 90-minute group sessions, parents and children mostly separate; parents targeted as main agents of change; interactive activities and PA for children; manuals for parents, workbooks for children and homework assigned</td>
<td>Group</td>
<td>Parent, child, family</td>
<td>15</td>
<td>90</td>
<td>6</td>
<td>43.5</td>
<td>Dietitian (parent sessions); advanced clinical nutrition students (child sessions) PCP: No role</td>
</tr>
<tr>
<td>Stark, 2011&lt;sup&gt;38&lt;/sup&gt;</td>
<td>Nine clinic-based 90-minute comprehensive behavioral lifestyle group sessions for parents and children separately plus 9 home visits; vegetable taste tests, pedometers, parents received 2 weeks’ worth of vegetables, child sessions included 15 minutes of PA</td>
<td>Group, Individual</td>
<td>Parent, child, family</td>
<td>18</td>
<td>90 (clinic), 60 to 90 (in-home)</td>
<td>6</td>
<td>38.25</td>
<td>Licensed clinical psychologist, post doc and research coordinator PCP: No role</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
<td>Format</td>
<td>Target</td>
<td>No. Sessions</td>
<td>Session length (minutes)</td>
<td>Duration (months)</td>
<td>Estimated hours</td>
<td>Clinician Role or PCP</td>
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</tr>
<tr>
<td>Croker, 2012</td>
<td>Fifteen 90-minute comprehensive multicomponent family-based behavioral therapy group sessions, parents and children meeting separately for 10 sessions and together for 5 sessions</td>
<td>Group</td>
<td>Parent, child, family</td>
<td>15</td>
<td>90</td>
<td>6</td>
<td>37.5</td>
<td>Psychologist, family therapist, dietitian PCP: No role</td>
</tr>
<tr>
<td>DeBar, 2012</td>
<td>Sixteen 90-minute group developmentally tailored multicomponent behavioral intervention sessions for adolescent girls; 12 with concurrent parent sessions; trained PCP to support behavioral weight management goals; 2 PCP meetings</td>
<td>Group, Individual X</td>
<td>Parent, child</td>
<td>18</td>
<td>90 (group), NR, estimated 15 minutes (PCP)</td>
<td>5</td>
<td>36.5</td>
<td>Nutritionists, health educators and clinical psychologists; PCPs PCP: Participated in intervention</td>
</tr>
<tr>
<td>Sacher, 2010</td>
<td>Eighteen 2-hour family-based multicomponent behavioral healthy lifestyle group sessions targeting education, skills training, and motivational enhancement; included 1-hour PA sessions in 16 of the sessions; free access to community pool</td>
<td>Group</td>
<td>Child, family</td>
<td>18</td>
<td>120</td>
<td>2.25</td>
<td>36</td>
<td>MEND leaders, assistant PCP: No role</td>
</tr>
<tr>
<td>Nemet, 2005</td>
<td>4 evening lectures for parents, 6 dietitian meetings, and twice-weekly PA sessions for 3 months</td>
<td>Group, Individual X</td>
<td>Parent, child, family</td>
<td>34</td>
<td>45 (dietitian), 60 (exercise and lectures)</td>
<td>3</td>
<td>32.5</td>
<td>Physicians, dietitians, youth coaches PCP: Participated in intervention</td>
</tr>
<tr>
<td>Stark, 2014</td>
<td>Ten 90-minute comprehensive behavioral lifestyle group sessions for parents and children separately; vegetable taste tests, pedometers, parents received 2 weeks’ worth of vegetables, child sessions included 15 minutes of moderate-to-vigorous PA.</td>
<td>Group, Individual</td>
<td>Parent, child</td>
<td>10</td>
<td>90</td>
<td>6</td>
<td>30</td>
<td>Clinical psychologist, pediatric psychologist, research coordinator PCP: No role</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
<td>Format</td>
<td>Target</td>
<td>PA Sessions</td>
<td>No. Sessions</td>
<td>Session length (minutes)</td>
<td>Duration (months)</td>
<td>Estimated hours</td>
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<td>--------------</td>
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</tr>
<tr>
<td>Bryant, 2011</td>
<td>16 weekly 30-minute individual sessions for support and encouragement and 1-hour PA group sessions; motivational enhancement and solution-focused approach to lifestyle change</td>
<td>Group, Individual</td>
<td>Child, family</td>
<td>X</td>
<td>16</td>
<td>30 (individual, parent), 60 (group PA)</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Mellin, 1987</td>
<td>14 90-minute weekly group adolescent sessions and 2 90-minute parent sessions plus separate workbooks for parent and adolescent; focus on successive, sustainable, small lifestyle modifications</td>
<td>Group</td>
<td>Parent, child</td>
<td>X</td>
<td>16</td>
<td>90</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>Golley, 2007</td>
<td>Triple P + healthy lifestyle group (IG1): Four 2-hour group sessions + 7 individual phone calls aimed at changing parenting practices and general parenting styles, and 7-session behavioral healthy lifestyle group for parents and concurrent child PA sessions</td>
<td>Group, Individual</td>
<td>Parent, child</td>
<td>X</td>
<td>18</td>
<td>120 (group parenting), 15 to 20 (calls)</td>
<td>5</td>
<td>23.75</td>
</tr>
<tr>
<td></td>
<td>Triple P (IG2): Four 2-hour group sessions and 7 individual phone followup sessions aimed at changing parenting practices and general parenting styles (no behavioral lifestyle component); workbook, and healthy lifestyle pamphlet</td>
<td>Group, Individual</td>
<td>Parent</td>
<td></td>
<td>11</td>
<td>120 (group), 15 to 20 (phone)</td>
<td>5</td>
<td>9.75</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
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<td>Target</td>
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<td>Session length (minutes)</td>
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</table>
| Hofsteenge, 2014 | Seven 90-minute group sessions plus 2 booster sessions covering diet, PA, and cognitive behavior therapy for adolescents; 2 separate parent sessions | Group | Parent, child | 11 | 90 | 6 | 16.5 | Dietitian, pediatrician/endocrinologist, psychologist  
PCP: No role |
| Gerards, 2015 | 10 90-minute group sessions and four individual 15- to 30-minute phone sessions aimed at changing parenting practices and styles with specific strategies around lifestyle change; workbook, recipes and active games booklet | Group, Individual | Parent | 14 | 90 (group), 15 to 30 (telephone) | 3.5 | 16.5 | Health professionals (not further specified)  
PCP: No role |
| Nowicka, 2008 | Four 4-hour family group comprehensive behavioral lifestyle meetings, emphasizing communication skills, mutual support, consistency, establishing appropriate limits; 10-minute individual meeting with pediatrician each session | Group, Individual | Parent, child, family | 4 | 240 (including 10 minutes of individual PCP session) | 12 | 16 | Pediatrician, dietitian/sports trainer, pediatric nurse, family therapist  
PCP: Participated in intervention |
| Boudreau, 2013 | Six 90-minute PowerUp classes (separate, interactive group sessions for children and caregivers) covering nutrition, PA, and stress management, plus 6 monthly individual culturally sensitive health coaching sessions | Group, Individual | Parent, child, family | X | 90 | 6 | 10.5 | Health educator, physical therapist, nutritionist, and primary care pediatrician  
PCP: Participated in intervention |
<table>
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<tr>
<th>Author, Year</th>
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<th>Clinician Role or PCP</th>
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</table>
| Norman, 2015<sup>27</sup> | Stepped-down care, tailored to progress of individual participants in achieving weight loss goals | Individual | Parent, child | 27 | NR | 13 | 8.25 | Physician, health education counselor  
PCP: Participated in intervention |
| Taylor, 2015<sup>51</sup> | One individual 1- to 2-hour multidisciplinary session with parents followed by 16 brief contacts for tailored behavioral lifestyle change support. | Individual | Parent | 14 | 60 to 120 (multidisc consult), 30 to 40 (in-person visits), 5 to 10 (phone calls) | 24 | 7.2 | Mentor, nutritionist/dietitian, exercise specialist/trainer, clinical psychologist  
PCP: No role |
| Raynor, 2012a<sup>6</sup> | DECREASE + Growth Monitoring (IG1): Eight 45-minute parent group sessions covering behavioral strategies to decrease high-calorie non-nutrient dense foods; growth assessed at 0, 3, 6 months with accompanying letter providing anthropometric information and interpretation | Group | Parent | 8 | 45 | 6 | 6 | Research-staff therapist (master or doctoral-level with expertise in nutrition or exercise and behavior modification)  
PCP: No role |
| | INCREASE + Growth Monitoring (IG2): Eight 45-minute parent group sessions covering behavioral strategies to increase healthy food intake; growth assessed at 0, 3, 6 months with accompanying letter providing anthropometric information and interpretation | Group | Parent | 8 | 45 | 6 | 6 | Research-staff therapist (master or doctoral-level with expertise in nutrition or exercise and behavior modification)  
PCP: No role |
<table>
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<tr>
<th>Author, Year</th>
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<tbody>
<tr>
<td>Raynor, 2012b</td>
<td>TRADITIONAL + Growth Monitoring (IG1): Eight 45-minute parent group sessions covering behavioral strategies to increase PA and reduce sugar-sweetened beverage consumption; growth assessed at 0, 3, 6 months with accompanying letter providing anthropometric information and interpretation</td>
<td>Group</td>
<td>Parent</td>
<td>8</td>
<td>45</td>
<td>6</td>
<td>6</td>
<td>Research-staff therapist (master or doctoral-level with expertise in nutrition or exercise and behavior modification) PCP: No role</td>
</tr>
<tr>
<td>Kong, 2013</td>
<td>Initial MI visit with PCP and student to review medical history/lab results, assess diet and PA, receive DVD; 7 followup MI visits with PCP to discuss DVD and work toward healthy lifestyle goals; newsletter and 8 post-visit MI calls to parents/caregivers</td>
<td>Individual</td>
<td>Parent, child</td>
<td>16</td>
<td>47 (mean, first session), 24 (mean, subsequent sessions)</td>
<td>9</td>
<td>4.25</td>
<td>School-based health center clinician (family medicine NP) PCP: Participated in intervention</td>
</tr>
<tr>
<td>Stettler, 2014</td>
<td>Multiple-behavior change (IG1): Twelve 15- to 25-minute sessions targeting healthy beverages, increased PA, and reduced sedentary activity, incorporating behavior change techniques</td>
<td>Individual</td>
<td>Family</td>
<td>12</td>
<td>15 to 25</td>
<td>12</td>
<td>4</td>
<td>Trained primary care clinician PCP: Participated in intervention</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
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<td>Target</td>
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</table>
| Saelens, 2002<sup>22</sup> | Combined (IG2): Twelve 15- to 25-minute sessions incorporating behavior change techniques targeting healthy beverages, increased PA, and reduced sedentary activity (IG2), or targeting health beverage consumption only (IG3) | Individual | Family | 12 | 15 to 25 | 12 | 4 | Trained PCP  
PCP: Participated in intervention |
|            | Beverage-only intervention (IG3): Twelve 15- to 25-minute sessions to reduce intake of sugary drinks and increase intake of water and milk, incorporating behavior change techniques | Individual | Family | 12 | 15 to 25 | 12 | 4 | Trained primary care clinician  
PCP: Participated in intervention |
| Saelens, 2002<sup>22</sup> | Computer assessment with 1 pediatrician session to discuss results with family; 11 phone counseling calls; 3 mailings | Individual | Child, family | 13 | Computer and pediatrician sessions NR; 10 to 20 minutes (average 16.4 minutes) phone sessions | 4 | 3.75 | Pediatrician; phone counselors  
PCP: Participated in intervention |
<table>
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<tr>
<th>Author, Year</th>
<th>Description</th>
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<th>No. Sessions</th>
<th>Session length (minutes)</th>
<th>Duration (months)</th>
<th>Estimated hours</th>
<th>Clinician Role or PCP</th>
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<tbody>
<tr>
<td>Broccoli, 2016</td>
<td>Five individual MI sessions with parent and child and pediatrician; families decided on goals, progress discussed at subsequent meetings</td>
<td>Individual</td>
<td>Parent, child, family</td>
<td>5</td>
<td>30 to 60</td>
<td>3</td>
<td>3.75</td>
<td>Family pediatrician &lt;br&gt;PCP: Participated in intervention</td>
</tr>
<tr>
<td>O'Connor, 2013</td>
<td>Six monthly individual family sessions with health advisors with follow-up phone call after each session; set monthly child-behavior goals with implementation plan and behavior-specific parenting practice goals</td>
<td>Individual</td>
<td>Family</td>
<td>12</td>
<td>NR</td>
<td>7</td>
<td>3.5</td>
<td>Trained allied health staff&lt;br&gt;&quot;health advisors&quot; &lt;br&gt;PCP: No role</td>
</tr>
<tr>
<td>Sherwood, 2015</td>
<td>One brief primary care session followed by 8 15- to 30-minute phone coaching sessions for goal setting and MI</td>
<td>Individual</td>
<td>Parent, child, family</td>
<td>9</td>
<td>NR (in-person), 15- to 30, average 23 (phone)</td>
<td>6</td>
<td>3.32</td>
<td>Pediatric primary care clinician; experienced interventionists&lt;br&gt;PCP: 1-time brief message or endorsement</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
<td>Format</td>
<td>Target</td>
<td>No. Sessions</td>
<td>Session length (minutes)</td>
<td>Duration (months)</td>
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</table>
| Taveras, 2011<sup>58</sup> | 4 25-minute in-person + 3 15-minute phone MI sessions with NP. Pediatricians endorsed messages during well-child visits. Tailored materials, behavior monitoring tools, enhanced electronic medical record. | Individual | Family | 8 | 15 to 25 | 12 | 2.67 | NP (primary interventionist), pediatrician  
PCP: Participated in intervention |
| Love-Osborne, 2014<sup>50</sup> | Average of 5 visits with health educator using MI, goal-setting, self-monitoring, with or without supporting text messages; participants linked to existing resources and facilitated applications for free recreation memberships | Individual | Child | 5 | NR | 8 | 2.5 | Health educator  
PCP: No role |
| Looney, 2014<sup>58</sup> | Newsletters + Growth Monitoring + Family-based Bx Counseling (IG1): Six 20- to 30-minute in-person or phone sessions for growth monitoring/feedback and caretaker behavioral counseling; 6 monthly educational newsletters on nutrition and activity; usual care from the pediatrician | Individual | Parent, child, family | 6 | 30 (in-person), 20 (telephone) | 6 | 2.5 | Trained interventionist + pediatrician  
PCP: No role |

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<tr>
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<th>Clinician Role or PCP</th>
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</table>
| Newsletters + Growth Monitoring (IG2): Six 10- to 15-minute in-person or phone growth monitoring sessions with standardized feedback; 6 monthly educational newsletters on nutrition and leisure-lime activity; usual care from the pediatrician | Individual | Child, family | 6 | 15 (in-person), 10 (telephone) | 6 | 1.25 | Trained interventionist + pediatrician  
PCP: No role |
| Resniçow, 2015 | PCP + RD MI (IG1): Four brief MI counseling sessions by PCP + 6 MI counseling sessions from RD conducted over 2 years, targeting diet and activity behaviors | Individual | Parent | 10 | NR | 24 | 2.5 | PCP (pediatrician and NPs) and RD  
PCP: Participated in intervention |
| | PCP MI (IG2): Four brief MI counseling sessions over 2 years conducted by PCP, targeting diet and activity behaviors | Individual | Parent | 4 | NR | 24 | 1 | PCP (pediatrician and NPs)  
PCP: Participated in intervention |
| Wake, 2013 | One hour-long family visit with obesity specialist team to develop plan and goals, followed by GP visits every 4 to 8 weeks using brief solution-focused techniques; web-based software (HopSCOTCH) used to track progress and link specialist team with GP | Individual | Family | 6 | 60 (specialist), 20-40 (1 long GP appointment), 6-20 (standard GP appointment) | 12 | 2.5 | GP, obesity specialist team (pediatrician and dietitian)  
PCP: Participated in intervention |
<table>
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<tr>
<th>Author, Year</th>
<th>Description</th>
<th>Format</th>
<th>Target</th>
<th>No. Sessions</th>
<th>Session length (minutes)</th>
<th>Duration (months)</th>
<th>Estimated hours</th>
<th>Clinician Role or PCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Van Grieken, 2013</td>
<td>Prevention protocol involving MI during a well-child visit; 3 additional structured healthy lifestyle counseling sessions matched to parents' stage of change could be offered.</td>
<td>Individual</td>
<td>Family</td>
<td>4</td>
<td>NR; average duration of first additional session, 24.76 (range, 0 to 60)</td>
<td>12</td>
<td>2</td>
<td>Youth Health Care Team (pediatrician, nurse, assistant) PCP: Participated in intervention</td>
</tr>
<tr>
<td>Taveras, 2015</td>
<td>CDS+ coaching (IG1): Computerized CDS system with point of care prompts at well-child visit, MI, participant materials + 4 phone MI sessions by health coach and optional text message program</td>
<td>Individual</td>
<td>Parent, family</td>
<td>5</td>
<td>75</td>
<td>12</td>
<td>1.25</td>
<td>Pediatrician, health coach PCP: Participated in intervention</td>
</tr>
<tr>
<td></td>
<td>CDS (IG2): Computerized CDS system with point-of-care prompts at well-child visit, MI, participant materials</td>
<td>Individual</td>
<td>Family</td>
<td>1</td>
<td>15</td>
<td>12</td>
<td>0.25</td>
<td>Pediatrician PCP: Participated in intervention</td>
</tr>
<tr>
<td>McCallum, 2007</td>
<td>Four GP consultations using brief solution-focused family therapy for healthy lifestyle goals; 16-page folder of materials including topic sheets, wall chart, reward stickers, and shopping tips</td>
<td>Individual</td>
<td>Family</td>
<td>4</td>
<td>“Brief”</td>
<td>3</td>
<td>1</td>
<td>GP PCP: Participated in intervention</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
<td>Format</td>
<td>PA Sessions</td>
<td>Target</td>
<td>No. Sessions</td>
<td>Session length (minutes)</td>
<td>Duration (months)</td>
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</tbody>
</table>
| Wake, 2009a | Four GP consultations using brief solution-focused family therapy for healthy lifestyle goals; 16-page folder of materials including topic sheets, wall chart, reward stickers, and shopping tips | Individual | Family | 4 | “Brief” | 3 | 1 | GP  
PCP: Participated in intervention |

**Lifestyle-based Maintenance After Weight Loss Interventions**

| Davis, 2012a | Eight 90-minute group classes for adolescents after completion of weight loss program, reinforcing the content previously covered; 4 additional motivational telephone calls to explore and resolve ambivalence; separate parent classes, asked to attend 2. | Group, Individual | X | Parent, child | 14 | 15 (phone), 90 (group) | 8 | 16 | Trained research staff  
PCP: No role |

**Non-Lifestyle Behavior-based Interventions**

| Boutelle, 2014a | Fourteen group sessions of behavioral counseling based on appetite awareness and cue exposure treatment. Core components included psychoeducation, parenting skills, coping skills, self-monitoring of hunger and cravings, and experiential learning | Group | Parent, child, family | 14 | 45 (separate child and parent groups); 30 (joint child and parent) | 4 | 28 | Doctoral-level psychologists assisted by masters-level co-therapists and undergraduate volunteers  
PCP: No role |

| Tanofsky-Kraff, 2010a | Twelve 75- to 90-minute interpersonal psychotherapy group meetings + individual 1.5-hour pre-group meeting; overeating and loss-of-control eating linked to interpersonal functioning | Group, Individual | Child | 13 | 90 (individual), 75-90 (group) | 3 | 17.9 | Psychologist, graduate student  
PCP: No role |
<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Description</th>
<th>Format</th>
<th>Target</th>
<th>No. Sessions</th>
<th>Session length (minutes)</th>
<th>Duration (months)</th>
<th>Estimated hours</th>
<th>Clinician Role or PCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarson, 2014&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Metformin 2000 mg daily + lifestyle intervention consisting of the following sessions over 12 months: 66 group exercise, 12 dietitian, 12 social worker, 4 group family, and 12 group child behavior change sessions. Total of 86 hours of direct contact.</td>
<td>Group, Individual</td>
<td>Child, family</td>
<td>106</td>
<td>30 (social worker), 30 (dietitian), 120 (group family), 20 (group behavior) 60 (exercise)</td>
<td>12</td>
<td>86</td>
<td>Exercise specialist, social worker, dietitian PCP: No role</td>
</tr>
<tr>
<td>Wiegand, 2010&lt;sup&gt;69&lt;/sup&gt;</td>
<td>Metformin 500 mg bid + multi-professional family-based lifestyle program consisting of individual goal setting, reinforcement sessions, and structured interview with basic education and 2 45-minute PA classes per week</td>
<td>Group, Individual</td>
<td>Family</td>
<td>58</td>
<td>45 (sport sessions), other NR</td>
<td>6</td>
<td>40.8</td>
<td>Multi-professional (not further described) PCP: No role</td>
</tr>
<tr>
<td>Wilson, 2010&lt;sup&gt;70&lt;/sup&gt;</td>
<td>Metformin 500 mg 4 times daily + 19 sessions of lifestyle cognitive-behavioral therapy program</td>
<td>Individual</td>
<td>Family</td>
<td>19</td>
<td>NR</td>
<td>12</td>
<td>9.5</td>
<td>Trained health specialist PCP: No role</td>
</tr>
<tr>
<td>Yanoyski, 2011&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Metformin 1 g bid + lifestyle intervention consisting of 6 monthly family meetings with dietitian and self-monitoring of food and activity using pedometer</td>
<td>Individual</td>
<td>Family</td>
<td>6</td>
<td>NR</td>
<td>6</td>
<td>3</td>
<td>Dietitian PCP: No role</td>
</tr>
<tr>
<td>Love-Osborne, 2008&lt;sup&gt;12&lt;/sup&gt;</td>
<td>Metformin 850 mg bid + 6 monthly individual goal-setting sessions; initial session included written material and video</td>
<td>Individual</td>
<td>Child</td>
<td>6</td>
<td>NR</td>
<td>6</td>
<td>2.25</td>
<td>Dietitian or study investigator and research assistant PCP: No role</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Description</td>
<td>Format</td>
<td>Target</td>
<td>PA Sessions</td>
<td>Target</td>
<td>No. Sessions</td>
<td>Session length (minutes)</td>
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<tr>
<td>Kendall, 2013&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Metformin 1.5 g/day and 1 standardized individual healthy lifestyle advice session</td>
<td>Individual</td>
<td>Child</td>
<td>1</td>
<td>NR</td>
<td>6</td>
<td>0.25</td>
<td>NR</td>
</tr>
<tr>
<td>Srinivasan, 2006&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Metformin 1 g bid + standardized information on healthy eating and exercise</td>
<td>Individual</td>
<td>Child</td>
<td>1</td>
<td>NR</td>
<td>6</td>
<td>0.25</td>
<td>NR</td>
</tr>
<tr>
<td>Freemark, 2001&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Metformin 500 mg bid; no dietary change attempted</td>
<td>NA</td>
<td>Child</td>
<td>0</td>
<td>NR</td>
<td>NA</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>Pharmacotherapy: Orlistat</td>
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</tr>
<tr>
<td>Yanovski, 2012&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Orlistat 120 mg tid for 6 months + plus 12-week behavioral weight loss program</td>
<td>Group</td>
<td>X</td>
<td>Child</td>
<td>15</td>
<td>NR</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Chanoine, 2005&lt;sup&gt;17&lt;/sup&gt;</td>
<td>Orlistat 120 mg tid + hypocaloric diet, exercise, and behavioral therapy; 18 individual meetings with dietitian and behavioral psychologist</td>
<td>Individual</td>
<td>Child</td>
<td>18</td>
<td>NR</td>
<td>12</td>
<td>9</td>
<td>Dietitian, behavioral psychologist</td>
</tr>
<tr>
<td>Maahs, 2006&lt;sup&gt;18&lt;/sup&gt;</td>
<td>Orlistat 120 mg tid + 7 monthly diet and exercise counseling sessions with dietitian</td>
<td>Individual</td>
<td>Child</td>
<td>7</td>
<td>NR</td>
<td>6</td>
<td>3.5</td>
<td>Dietitian</td>
</tr>
</tbody>
</table>

Abbreviations: bid = twice daily; CDS = clinical decision support; DVD = digital video disc; GP = general practitioner; IG = intervention group (intervention group 1 [IG] was the primary group and included in the meta-analysis if possible); MI = motivational interviewing; NA = not applicable; NP = nurse practitioner; NR = not reported; PA = physical activity; PE = physical education; RD = registered dietitian; tid = 3 times a day
Funnel plot with pseudo 95% confidence limits
Outcome=Weight (Main Behavioral Trials only)

Abbreviations: se = standard error; SMD = standardized mean difference
eReferences


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