

### Supplementary file S1: Tables S1-S3

**Table S1.** Search strategies for all databases

Database	Search strategy
Embase	<p>'child'/exp OR 'adolescent'/exp OR 'preschool child'/exp OR child*:ti,ab,kw OR adolesce*:ti,ab,kw OR juvenile*:ti,ab,kw OR pediater*:ti,ab,kw OR paediatric*:ti,ab,kw OR toddler*:ti,ab,kw OR preschool*:ti,ab,kw OR preteen*:ti,ab,kw OR teen*:ti,ab,kw OR youth*:ti,ab,kw OR kid*:ti,ab,kw</p> <p>AND</p> <p>'childhood obesity'/exp OR 'obesity'/exp OR overweigh*:ti,ab,kw OR obes*:ti,ab,kw</p> <p>AND</p> <p>'community participation'/exp OR 'participatory research'/exp OR 'participatory action research'/exp OR "CBPR":ti,ab,kw OR ((participat* NEAR/3 research*):ti,ab,kw) OR ((communit* NEAR/3 (participat* OR research* OR act* OR engag* OR partner* OR coalition* OR involv* OR contribut* OR cooperat* OR inform* OR consult* OR empower* OR effort* OR base* or basis*)):ab,ti,kw)</p> <p><b><u>Legend</u></b> *: truncation of word ab: abstract exp: exploded kw: keywords NEAR/n: words must be within n words inclusive of each other in the record ti: title</p>
Pubmed	<p>"Child"[MeSH Terms] OR "child, preschool"[MeSH Terms] OR "Adolescent"[MeSH Terms] OR "pediatr*"[Title/Abstract] OR "paediatr*"[Title/Abstract] OR "child*"[Title/Abstract] OR "toddler*"[Title/Abstract] OR "preschool*"[Title/Abstract] OR "preteen*"[Title/Abstract] OR "teen*"[Title/Abstract] OR</p>

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"adolesce\*"[Title/Abstract] OR "youth\*"[Title/Abstract] OR "juvenile\*"[Title/Abstract] OR "kid"[Title/Abstract]  
OR "kids"[Title/Abstract]

AND

"Pediatric Obesity"[MeSH Terms] OR "Obesity"[MeSH Terms] OR "Overweight"[MeSH Terms] OR  
"overweigh\*"[Title/Abstract] OR "obes\*"[Title/Abstract]

AND

"Community Participation"[MeSH Terms] OR "Community-Based Participatory Research"[MeSH Terms] OR  
"CBPR"[Title/Abstract] OR "participate research"[Title/Abstract:~3] OR "participate researches"[Title/Abstract:~3]  
OR "participate researched"[Title/Abstract:~3] OR "participate researching"[Title/Abstract:~3] OR "participates  
research"[Title/Abstract:~3] OR "participates researches"[Title/Abstract:~3] OR "participates  
researched"[Title/Abstract:~3] OR "participates researching"[Title/Abstract:~3] OR "participating  
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participate"[Title/Abstract:~3] OR "Community Participation"[Title/Abstract:~3] OR "community  
participations"[Title/Abstract:~3] OR "community participates"[Title/Abstract:~3] OR "community  
participated"[Title/Abstract:~3] OR "community participatory"[Title/Abstract:~3] OR "communities

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participate"[Title/Abstract:~3] OR "communities participation"[Title/Abstract:~3] OR "communities participations"[Title/Abstract:~3] OR "communities participates"[Title/Abstract:~3] OR "communities participated"[Title/Abstract:~3] OR "communities participatory"[Title/Abstract:~3] OR "community action"[Title/Abstract:~3] OR "community actions"[Title/Abstract:~3] OR "community act"[Title/Abstract:~3] OR "community acts"[Title/Abstract:~3] OR "community acted"[Title/Abstract:~3] OR "community acting"[Title/Abstract:~3] OR "communities action"[Title/Abstract:~3] OR "communities actions"[Title/Abstract:~3] OR "communities act"[Title/Abstract:~3] OR "communities acts"[Title/Abstract:~3] OR "communities acted"[Title/Abstract:~3] OR "communities acting"[Title/Abstract:~3] OR "community engage"[Title/Abstract:~3] OR "community engages"[Title/Abstract:~3] OR "community engaged"[Title/Abstract:~3] OR "community engagement"[Title/Abstract:~3] OR "community engagements"[Title/Abstract:~3] OR "community engaging"[Title/Abstract:~3] OR "communities engage"[Title/Abstract:~3] OR "communities engages"[Title/Abstract:~3] OR "communities engaged"[Title/Abstract:~3] OR "communities engagement"[Title/Abstract:~3] OR "communities engagements"[Title/Abstract:~3] OR "communities engaging"[Title/Abstract:~3] OR "community partner"[Title/Abstract:~3] OR "community partners"[Title/Abstract:~3] OR "community partnered"[Title/Abstract:~3] OR "community partnership"[Title/Abstract:~3] OR "community partnerships"[Title/Abstract:~3] OR "community partnering"[Title/Abstract:~3] OR "communities partner"[Title/Abstract:~3] OR "communities partners"[Title/Abstract:~3] OR "communities partnered"[Title/Abstract:~3] OR "communities partnership"[Title/Abstract:~3] OR "communities partnerships"[Title/Abstract:~3] OR "communities partnering"[Title/Abstract:~3] OR "community coalition"[Title/Abstract:~3] OR "community coalitions"[Title/Abstract:~3] OR "communities coalition"[Title/Abstract:~3] OR "communities coalitions"[Title/Abstract:~3] OR "community involve"[Title/Abstract:~3] OR "community involves"[Title/Abstract:~3] OR "community involved"[Title/Abstract:~3] OR "community involving"[Title/Abstract:~3] OR "community involvement"[Title/Abstract:~3] OR "community involvements"[Title/Abstract:~3] OR "communities involve"[Title/Abstract:~3] OR "communities involves"[Title/Abstract:~3] OR "communities involved"[Title/Abstract:~3] OR "communities involving"[Title/Abstract:~3] OR "communities involvement"[Title/Abstract:~3] OR "communities involvements"[Title/Abstract:~3] OR "community contribute"[Title/Abstract:~3] OR "community contributes"[Title/Abstract:~3] OR "community contributed"[Title/Abstract:~3] OR "community contribution"[Title/Abstract:~3] OR "community contributions"[Title/Abstract:~3] OR "community contributing"[Title/Abstract:~3] OR "communities contribute"[Title/Abstract:~3] OR "communities contributes"[Title/Abstract:~3] OR "communities

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contributed"[Title/Abstract:~3] OR "communities contribution"[Title/Abstract:~3] OR "communities contributions"[Title/Abstract:~3] OR "communities contributing"[Title/Abstract:~3] OR "community cooperate"[Title/Abstract:~3] OR "community cooperates"[Title/Abstract:~3] OR "community cooperated"[Title/Abstract:~3] OR "community cooperating"[Title/Abstract:~3] OR "community cooperation"[Title/Abstract:~3] OR "communities cooperate"[Title/Abstract:~3] OR "communities cooperates"[Title/Abstract:~3] OR "communities cooperated"[Title/Abstract:~3] OR "communities cooperating"[Title/Abstract:~3] OR "communities cooperation"[Title/Abstract:~3] OR "community inform"[Title/Abstract:~3] OR "community informs"[Title/Abstract:~3] OR "community informed"[Title/Abstract:~3] OR "community informing"[Title/Abstract:~3] OR "community information"[Title/Abstract:~3] OR "communities inform"[Title/Abstract:~3] OR "communities informs"[Title/Abstract:~3] OR "communities informed"[Title/Abstract:~3] OR "communities informing"[Title/Abstract:~3] OR "communities information"[Title/Abstract:~3] OR "community consult"[Title/Abstract:~3] OR "community consults"[Title/Abstract:~3] OR "community consulted"[Title/Abstract:~3] OR "community consulting"[Title/Abstract:~3] OR "community consultation"[Title/Abstract:~3] OR "community consultations"[Title/Abstract:~3] OR "community consultant"[Title/Abstract:~3] OR "community consultants"[Title/Abstract:~3] OR "communities consult"[Title/Abstract:~3] OR "communities consults"[Title/Abstract:~3] OR "communities consulted"[Title/Abstract:~3] OR "communities consulting"[Title/Abstract:~3] OR "communities consultation"[Title/Abstract:~3] OR "communities consultations"[Title/Abstract:~3] OR "communities consultant"[Title/Abstract:~3] OR "communities consultants"[Title/Abstract:~3] OR "community empower"[Title/Abstract:~3] OR "community empowers"[Title/Abstract:~3] OR "community empowerment"[Title/Abstract:~3] OR "community empowered"[Title/Abstract:~3] OR "community empowering"[Title/Abstract:~3] OR "community empowerments"[Title/Abstract:~3] OR "communities empower"[Title/Abstract:~3] OR "communities empowers"[Title/Abstract:~3] OR "communities empowerment"[Title/Abstract:~3] OR "communities empowered"[Title/Abstract:~3] OR "communities empowering"[Title/Abstract:~3] OR "communities empowerments"[Title/Abstract:~3] OR "community effort"[Title/Abstract:~3] OR "community efforts"[Title/Abstract:~3] OR "community efforted"[Title/Abstract:~3] OR "communities effort"[Title/Abstract:~3] OR "communities efforts"[Title/Abstract:~3] OR "communities efforted"[Title/Abstract:~3] OR "community base"[Title/Abstract:~3] OR "community based"[Title/Abstract:~3] OR "community bases"[Title/Abstract:~3] OR "community basing"[Title/Abstract:~3] OR "community basis"[Title/Abstract:~3] OR "communities base"[Title/Abstract:~3] OR "community bases"[Title/Abstract:~3] OR

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"communities based"[Title/Abstract:~3] OR "communities basing"[Title/Abstract:~3] OR "communities basis"[Title/Abstract:~3]

**Legend**

\*: truncation of word

~n: words terms are within 'n' number of words within each other, in either direction

Mesh: Medical subject heading

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The  
Cochrane  
Library

MeSH descriptor: [Child] explode all trees OR MeSH descriptor: [Adolescent] explode all trees OR MeSH descriptor: [Child, Preschool] explode all trees or (pediatr\* or paediatr\* or child\* or toddler\* or preschool\* or preteen\* or teen\* or adolesce\* or youth\* or juvenile\* or kid\*):ti,ab,kw

AND

MeSH descriptor: [Pediatric Obesity] explode all trees OR MeSH descriptor: [Obesity] explode all trees OR MeSH descriptor: [Overweight] explode all trees OR (overweigh\* or obes\*):ti,ab,kw

AND

MeSH descriptor: [Community Participation] explode all trees OR MeSH descriptor: [Community-Based Participatory Research] explode all trees OR (CBPR or (participat\* NEAR/3 research\*) or ((communit\*) NEAR/3 (participat\* or research\* or act\* or engag\* or partat\* or coalition\* or involv\* or contribut\* or cooperat\* or inform\* or consult\* or empower\* or effort\* or base\* OR basing\* OR basis\*))) :ti,ab,kw

**Legend**

\*: word truncation

MeSH: Medical Subject Heading

NEAR/n: terms are within 'n' number of words within each other, in either direction

ti,ab,kw: title, abstract, keyword

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Cinahl (EBSCO) MH "Child+" OR MH "Adolescence+" OR TI (pediatr\* or paediatr\* or child\* or toddler\* or preschool\* or preteen\* or teen\* or adolesce\* or youth\* or juvenile\* or kid\*) OR AB (pediatr\* or paediatr\* or child\* or toddler\* or preschool\* or preteen\* or teen\* or adolesce\* or youth\* or juvenile\* or kid\*)

AND

MH "Pediatric Obesity" OR MH "Obesity+" OR TI (overweigh\* or obes\*) OR AB (overweight\* or obes\*)

AND

MH "Community Role" OR MH "Stakeholder Participation" OR MH "Consumer Participation" OR MH "Action Research" OR TI ("CBPR" or (participat\* N3 research\*) or (communit\* N3 (participat\* or research\* or act\* or engag\* or partner\* or coalition\* or involv\* or contribut\* or cooperat\* or inform\* or consult\* or empower\* or effort\* or base\* or basing\* or basis\*))) OR AB ("CBPR" or (participat\* N3 research\*) or (communit\* N3 (participat\* or research\* or act\* or engag\* or partner\* or coalition\* or involv\* or contribut\* or cooperat\* or inform\* or consult\* or empower\* or effort\* or base\* or basing\* or basis\*)))

### **Legend**

\*: truncation of word

+: explode

AB: abstract

MH: major subject heading

Nn: the terms are 'n' number of words within each other, in either direction

TI: title

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Psycinfo (Ovid) exp Nursery School Students/ OR exp Preschool Students/ OR exp Kindergarten Students/ OR exp Elementary School Students/ OR exp Junior High School Students/ OR exp High School Students/ OR (pediatr\* or paediatr\* or child\* or toddler\* or preschool\* or preteen\* or teen\* or adolesce\* or youth\* or juvenile\* or kid\*).ab,ti,tw

AND

exp Obesity/ OR exp Overweight/ OR (overweigh\* or obes\*).ab,ti,tw.

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AND

exp Community Involvement/ OR exp Action Research/ OR (“CBPR” or (participat\* adj3 research\*) or (communit\* adj3 (participat\* or research\* or act\* or engag\* or partner\* or coalition\* or involv\* or contribut\* or cooperat\* or inform\* or consult\* or empower\* or effort\* or base\* or basing\* or basis\*))).ab,ti,tw.

**Legend**

\*: truncation of word

ab: abstract

adj/n: the terms are ‘n’ number of words within each other, in either direction

Exp: explode

ti: title

tw: text word

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ProQuest subject(Children & youth) OR subject(Toddlers) OR subject(Preschool children) OR subject(Teenagers) OR  
Dissertations noft(pediatr\* OR paediatr\* OR child\* OR toddler\* OR preschool\* OR preteen\* OR teen\* OR adolesce\* OR youth\*  
& Theses OR juvenile\* OR kid\*)  
Global

AND

subject(Overweight) OR subject(Obesity) OR noft(overweigh\* OR obes\*)

AND

subject(Participatory research) OR subject(Citizen participation) OR subject(Community action) OR noft(“CBPR” OR (participat\* NEAR/3 research\*) OR (communit\* NEAR/3 (participat\* OR research\* OR act\* OR engag\* OR partner\* OR coalition\* OR involv\* OR contribut\* OR cooperat\* OR inform\* OR consult\* OR empower\* OR effort\* OR base\* OR basing\* OR basis\*)))

**Legend**

\*: truncation of word

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NEAR/n: the terms are 'n' number of words within each other, in either direction  
noft: not in full text

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Web of  
science  
(Thomson  
Reuters)

TS=(child\* OR adolesce\* OR juvenile\* OR pediater\* OR paediatric\* OR toddler\* OR preschool\* OR preteen\* OR  
teen\* OR youth\* OR kid\*)

AND

TS=(overweigh\* OR obes\*)

AND

TS=(“CBPR” OR (participat\* NEAR/3 research\*) OR (communit\* NEAR/3 (participat\* OR research\* OR act\* OR  
engag\* OR partner\* OR coalition\* OR involv\* OR contribut\* OR cooperat\* OR inform\* OR consult\* OR  
empower\* OR effort\* OR base\* OR basing\* OR basis\*)))

### **Legend**

\*: truncation of word

TS: Topic (Searches title, abstract, author keywords, and Keywords Plus)

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Scopus  
(Elsevier)

TITLE-ABS-KEY (child\* OR adolesce\* OR juvenile\* OR pediater\* OR paediatric\* OR toddler\* OR preschool\* OR  
preteen\* OR youth\* OR kid\*)

AND

TITLE-ABS-KEY (overweight\* OR obes\*)

AND

TITLE-ABS-KEY ("cbpr" OR (participat\* w/3 research\*) OR (communit\* w/3 (participat\* OR research\* OR act\*  
OR engag\* OR partner\* OR coalition\* OR involv\* OR contribut\* OR cooperat\* OR inform\* OR consult\* OR  
empower\* OR effort\* OR base\* OR basing\* OR basis\*)))

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**Legend**

\*: truncation of word

ABS: abstract

KEY: keyword

W/n: the terms are 'n' number of words within each other, in either direction

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**Table S2.** Table of included studies' characteristics

Study ID (Country)	Research Design/ Study Arms	Participant number/ Age mean (SD) or mean (range) or range	Community engagement: 1. Planning 2. Design 3. Implementation 4. Data collection 5. Results analysis/dissemination	Intervention content  (intervention change: behavioral/ environmental change/both)	Setting/ Personnel  (mode of delivery: calls/in-person/newsletter/online)	Intervention overall duration  (follow up from post-intervention)	Outcomes: 1. BMI-z 2. Fruits 3. Vegetables 4. SSB 5. MVPA 6. SST 7. EGT	Attrition rate	Any framework?  ITT?
Adab et al., 2018 (United Kingdom)	2 arm Cluster RCT: 1. WAVES (n = 1134) 2. Usual care (n = 1328)	T: Year 2 primary school children Age: 6-7 years old	1. Yes 2. Yes 3. Yes 4. No 5. No	-Health behavior skills -Physical activity  (behavioral change)	School-based/ class teachers, school staff, sporting institution community coaches and staff  (in-person)	1 year  (18 months)	1. Yes 2. No 3. No 4. No 5. Yes 6. No 7. No	Post test: I: 13.9% C: 10.8% T: 12.3%  Follow up (30 months): I: 23.2% C: 17.7% T: 20.3% Follow up (39 months): I: 67.3% C: 65.3% T: 66.3%	Yes  Yes
Black et al., 2010 (United States)	2 arm RCT: 1. Challenge (n = 121) 2. Control (n = 114)	I: 62 girls, 59 boys Age: 13.3 years (1.0) C: 54 girls, 60 boys Age: 13.3 years (1.0)	1. No 2. Yes 3. Yes 4. No 5. No	-Goal setting -Healthy Eating -Mentorship -Participatory learning -Physical activity -Progress tracking  (behavioral change)	Community- and home-based/ college-enrolled mentors  (in-person)	10 months  (14 months)	1. Yes 2. Yes 3. Yes 4. Yes 5. No 6. No 7. No	Post test: I: 24.8% C: 18.4% T: 21.7%  Follow up: I: 26.4% C: 21.1% T: 23.8%	Yes  Yes
Buch-Andersen	2 arm CCT: 1. Danish Sundhed og	I: 105 girls, 96 boys	1. Yes 2. Yes 3. Yes	-Capacity building -Healthy eating practices	Community- and school-based/ after-school centers, childcare centers, civil	19 months  (no follow up)	1. Yes 2. No 3. No	Baseline: I: 46.3% C: 48.8%	Yes  Yes

et al., 2021 (Denmark)	Lokasamfund (n = 238) 2. Usual care (n = 214)	Age: 6.51 years (1.49) C: 90 girls, 76 boys Age: 6.21 years (1.80)	4. No 5. No	-Physical activity (both)	society organizations, local mass media, local stakeholders, primary schools, resource persons with various expertise, supermarkets  (in-person)	4. No 5. No 6. No 7. No	T: 47.5%  Post test: I: 24.5% C: 21.7% T: 23.2%		
Crespo et al., 2012 (United States)	4 arm Cluster RCT 1. Community only [Comm] (n = 218) 2. Family only [F] (n = 198) 3. Community and Family [Comm+F] (n = 165) 4. Control (n = 227)	T: kindergarten to Grade 2 elementary school children	1. No 2. Yes 3. Yes 4. No 5. No	-Active play -Environmental change -Healthy eating -Screen time  (environmental change)	Community- and home-based/ promotoras (calls, in-person)	1 year  (1 year, 2 years)	1. Yes 2. No 3. No 4. Yes 5. No 6. No 7. No	Post test: Comm: 9.3% F: 13.9% Comm+F: 11.0% C: 8.1% T: 10.4%  Follow up (1 year): Comm: 28.7% F: 27.8% Comm+F: 27.0% C: 23.3% T: 26.6% Follow up (2 years): Comm: 40.7% F: 50.5% Comm+F: 49.1% C: 39.9% T: 44.5%	Yes  No
Davis et al., 2016 (United States)	2 arm RCT: 1. CHILE (n = 214) 2. Usual care (n = 229)	T: 4-6 years old children	1. Yes 2. Yes 3. Yes 4. No 5. No	-Availability and visibility of healthier food options in grocery stores -Family engagement -Food service -Local healthcare provider engagement	Community- and school-based/ grocery stores, Head Start staff, healthcare providers, schools	2 years  (no follow up)	1. Yes 2. No 3. No 4. No 5. No 6. No 7. No	(attrition not stated)	Yes  Yes

-Nutrition -Physical activity									
(both)									
Economos et al., 2013 (United States)	2 arm CCT: 1. Shape Up Somerville (n = 647) 2. Control (n = 1074)	T: Grade 1-3 children	1. Yes 2. Yes 3. Yes 4. No 5. No	-Access and availability of physical activity options and healthy food  (both)	Community-, home- and school-based/ before-and after-school programs, city departments, food service providers, healthcare providers, media, parents, policy makers, restaurants, teachers  (in-person)	2 years  (no follow up)	1. Yes 2. No 3. No 4. No 5. No 6. No 7. No	Post test: I: 27.3% C: 22.1% T: 23.9%	Yes  Yes
Elinder et al., 2012 (Sweden)	2 arm CCT: 1. SCIP-school programme (n = 328) 2. Usual care (n = 478)	T: Grade 2, 4, and 7 children	1. Yes 2. Yes 3. Yes 4. Yes 5. No	-Capacity building -Eating habits -Physical activity -Self-esteem  (both)	School-based/ local school health teams, school staff  (in-person)	2 years  (no follow up)	1. Yes 2. Yes 3. Yes 4. Yes 5. No 6. Yes 7. No	Post test: BMI-z: I: 5.5% C: 12.6% T: 9.7%  Behaviour: I: 14% C: 14% T: 14%	Yes  Yes
Folta et al., 2013 <sup>‡</sup> (United States)	2 arm CCT: 1. Shape Up Somerville (n = 647) 2. Control (n = 1074)	T: Grade 1-3 children	1. Yes 2. Yes 3. Yes 4. No 5. No	-Access and availability of physical activity options and healthy food  (both)	Community-, home- and school-based/ before-and after-school programs, city departments, food service providers, healthcare providers, media, parents, policy makers, restaurants, teachers  (in-person)	2 years  (no follow up)	1. No 2. No 3. No 4. Yes 5. No 6. Yes 7. No	Post test: Behaviour: I: 65.9% C: 45.5% T: 52.4%	Yes  Yes
Fotu et al., 2011 (Tonga)	2 arm CCT: 1. Ma'alaha Youth Project (n = 2610) 2. Usual care (n = 2182)	I: 441 girls, 374 boys Age: 14.4 years (2.0) C: 526 girls, 371 boys Age: 15.2 years (1.8)	1. Yes 2. Yes 3. Yes 4. No 5. No	-Capacity building -Education -Local fruit and vegetable promotion -Physical activity -Social marketing	Community-, policy- and school-based/ churches, community leaders, government, mass media, schools, student ambassadors, teachers, villages, youth groups,  (in-person)	2.5 years  (no follow up)	1. Yes 2. No 3. No 4. Yes 5. No 6. Yes 7. Yes	Post test: I: 24.7% C: 35.7% T: 30.9%	Yes  No

(environmental change)									
Fulkerson et al., 2022 <sup>®</sup> (United States)	2 arm RCT: 1. New Ulm at Healthy Offerings via the Mealtime Environment (n = 58) 2. Wait-list control (n = 56)	I: 30 girls, 26 boys Age: 9.0 years (1.0) C: 30 girls, 16 boys Age: 9.0 years (1.1)	1. Yes 2. Yes 3. Yes 4. No 5. No	-Capacity building -Cooking together as a family -Healthful home food environment -Positive family activities -Screen time -Snacks and family meals	Community-based/ health educator, registered dietician, students (calls, in-person)	7 months  (no follow up)	1. Yes 2. Yes 3. Yes 4. No 5. Yes 6. No 7. No	Post test: I: 3.6% C: 4.3% T: 3.9%	Yes  Yes
(both)									
Gómez et al., 2018 (Spain)	2 arm Cluster RCT: 1. Thao-Child Health Program (n = 1041) 2. Control (n = 1209)	I: 445 girls, 529 boys Age: 10.2 years (0.64) C: 556 girls, 556 boys Age: 10.1 years (0.60)	1. No 2. Yes 3. Yes 4. No 5. No	-Capacity building -Dietary intake -Healthy lifestyle -Physical activity  (behavioral change)	Community- and school-based/ associations, companies, health professionals, kindergarten, local producers and shop owners, media, schools, sports clubs  (in-person)	2 years  (no follow up)	1. Yes 2. No 3. No 4. No 5. No 6. No 7. No	Baseline: I: 10.4% C: 13.3% T: 12.0%  Post test: I: 6.4% C: 8.0% T: 7.3%	Yes  Yes
Kattelman et al., 2019 <sup>‡</sup> (United States)	2 arm RCT: 1. iCook 4-H (n = 151) 2. Control (n = 77)	T: 125 girls, 103 boys Age: 9.35 years (0.67)	1. Yes 2. Yes 3. Yes 4. Yes 5. No	-Develop cooking skills -Enhance family mealtime -Physical activity  (behavioral change)	Community-based/ 4-H staff, community paraprofessionals, extension educators, high school students, nutrition and nursing students, nutrition professionals, paraprofessionals  (in-person)	2 years  (no follow up)	1. No 2. No 3. No 4. No 5. Yes 6. No 7. No	Post test: I: 40.4% C: 54.5% T: 45.2%	Yes  Yes
Kremer et al., 2011 (Fiji)	2 arm CCT: 1. Healthy Youth, Healthy Communities (n = 23530) 2. Usual care (n = 6255)	T: Secondary school students Age: 13-18 years old	1. Yes 2. Yes 3. Yes 4. No 5. No	-Community capacity building -Healthy eating -Physical activity  (environmental change)	Community- and school-based / church groups, road traffic control officers, schools, teachers  (in-person)	2 years  (no follow up)	1. Yes 2. Yes 3. Yes 4. Yes 5. No 6. Yes 7. No	Post test: I: 67.1% C: 54.7% T: 59.3%	Yes  No
Malakellis et al., 2017	2 arm CCT: 1. Australian Capital	T: Secondary school students	1. Yes 2. Yes 3. Yes	-Active transport -Capacity building -Healthy eating	Community- and school-based/ local food producers, non-government and non-	3 years  (no follow up)	1. Yes 2. Yes 3. Yes	Post test: I: 20.5% C: 37.7%	Yes  No

(Australia )	Territory 'It's Your Move!' (n = 891) 2. Usual care (n = 666)	Age: 12-16 years	4. No 5. No	-Healthy food policies -Physical activity  (environmental change)	profit organization, school project officers, student ambassadors  (in-person)		4. Yes 5. No 6. Yes 7. No	T: 25.5%	
Millar et al., 2011 (Australia )	2 arm CCT: 1. It's Your Move! (n = 3505) 2. Usual care (n = 2508)	T: Secondary school Age: 14.6 years (1.42)	1. Yes 2. Yes 3. Yes 4. No 5. No	-Capacity building -Healthy eating -Physical activity  (environmental change)	Community- and school-based/ schools, school project officers, student ambassadors, teachers, walking groups  (in-person)	3 years  (no follow up)	1. Yes 2. Yes 3. Yes 4. Yes 5. No 6. Yes 7. No	Post test: I: 31.3% C: 34.5% T: 32.4%	Yes  No
Peña et al., 2021 (United States)	2 arm Cluster RCT: 1. Juntos Santiago (n = 2299) 2. Usual care + access to educational leaflets and videos (n = 1573)	I: 670 girls, 941 boys Age: 11.08 years (0.75) C: 252 girls, 45y boys Age: 11.15 years (0.79)	1. No 2. Yes 3. Yes 4. No 5. No	-Gamification -Healthy snacks -Physical activity -Reward system  (both)	School-based/ trained monitors  (in-person, online)	7 months  (no follow up)	1. Yes 2. No 3. No 4. No 5. No 6. No 7. No	Post test: I: 7.8% C: 7.1% T: 7.6%	Yes  Yes
Sanigorski et al., 2008 (Australia )	2 arm CCT: 1. Be Active Eat Well (n = 1001) 2. Usual care (n = 1183)	I: 447 girls, 386 boys Age: 11.13 years (2.27) C: 478 girls, 496 boys Age: 10.31 years (2.14)	1. Yes 2. Yes 3. Yes 4. No 5. No	-Capacity building -Nutrition -Physical activity -Screen time  (both)	Community-, policy- and school-based/ dietician, government, schools, media, teachers  (in-person)	3 years  (no follow up)	1. Yes 2. No 3. No 4. No 5. No 6. No 7. No	Post test: I: 16.8% C: 17.7% T: 13.4%	Yes  No
Scherr et al., 2017 (United States)	2 arm Cluster RCT: 1. Shaping Healthy Choices Program (n = 198) 2. Usual care (n = 245)	I: 94 girls, 104 boys Age: 9.63 years (0.37) C: 117 girls, 128 boys Age: 9.52 years (0.36)	1. Yes 2. Yes 3. Yes 4. No 5. No	-Dietary intake -Physical activity  (both)	School-based/ academic researchers, newsletter, nutrition educator, school  (in-person, newsletter)	4 years  (no follow up)	1. Yes 2. Yes 3. Yes 4. No 5. No 6. No 7. No	Post test: I: 2.4% C: 1.3% T: 1.8%	Yes  No

Taylor et al., 2007 (New Zealand)	2 arm CCT: 1. APPLE Project (n = 279) 2. Control (n = 234)	I: 112 girls, 138 boys Age: 7.7 years (1.8) C: 111 girls, 108 boys Age: 7.7 years (1.6)	1. Yes 2. Yes 3. Yes 4. No 5. No	-Healthy eating -Noncurricular physical activity  (both)	Community- and school-based/ community activity coordinators, schools, teachers  (in-person)	2 years  (no follow up)	1. Yes 2. Yes 3. Yes 4. Yes 5. No 6. No 7. No	Post test: I: 45.9% C: 41.5% T: 43.9%	Yes  No
Tomayko et al., 2019 (United States)	2 arm RCT: 1. Wellness journey (n = 225) 2. Safety journey (n = 225)	I: 115 girls, 110 boys Age: 45.9months (12.8) C: 111 girls, 114 boys Age: 44.1 months (13.2)	1. No 2. Yes 3. No 4. No 5. No	-Healthy eating habits -Physical activity -Screen time -Sleep habits  (behavioral change)	Home-based/ site coordinators, parents  (in-person, newsletter, online)	1 year  (no follow up)	1. Yes 2. No 3. No 4. Yes 5. No 6. No 7. No	(attrition not stated)	Yes  No
White et al., 2019 (United States)	2 arm RCT: 1. iCook 4-H (n = 151) 2. Control (n = 77)	T: 125 girls, 103 boys Age: 9.35 years (0.67)	1. Yes 2. Yes 3. Yes 4. Yes 5. No	-Develop cooking skills -Enhance family mealtime -Physical activity  (behavioral change)	Community-based/ 4-H staff, community paraprofessionals, extension educators, high school students, nutrition and nursing students, nutrition professionals, paraprofessionals  (in-person)	2 years  (no follow up)	1. Yes 2. No 3. No 4. No 5. No 6. No 7. No	Post test: I: 40.4% C: 54.5% T: 45.2%	Yes  Yes
Wong et al., 2016 (United States)	2 arm CCT: 1. Heathy Kids-Houston Program (n = 524) 2. Usual care (n = 353)	I: 265 girls, 259 boys Age: 10.30 years (0.04) C: 156 girls, 197 boys Age: 10.22 years (0.05)	1. No 2. Yes 3. Yes 4. No 5. No	-Dietary intake -Healthy lifestyle -Physical activity  (behavioral change)	Community-based/ clinical pediatric psychologist, community centers, government, health fitness professional, nutritional epidemiologist, school, transport authorities  (in-person)	18 weeks  (no follow up)	1. Yes 2. No 3. No 4. No 5. Yes 6. No 7. No	Post test: I: 45.0% C: 47.0% T: 45.8%	No  No

Legend: ANGELO = Analysis Grid for Elements Linked to Obesity; AR = action research methodology; BMI = body mass index; BMI-z = standardized BMI score; C = control; CBPR = community-based participatory research; CCT = controlled clinical trial; Comm = Community-only intervention; Comm+F = Family-plus-Community intervention; EGT = electronic game time; F&V = fruits and vegetables; F = Family-only intervention; I = intervention; ITT = intent-to-treat; MVPA = moderate-to-vigorous activity; N = No; NA = not applicable; RCT = randomized controlled trial; SD = standard deviation; SSB = sugar-sweetened beverages; SST = small screen time [i.e., television (TV), video, digital versatile discs (DVD)]; T = total; TST = total screen time; Y = Yes; ‡ = reported secondary outcomes for main study only; ⊕ = secondary outcomes reported at clinicaltrials.gov

**Table S3.** GRADE summary of evidence table

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Universal community engagement interventions	Comparison	Relative (95% CI)	Absolute (95% CI)		
<b>BMI-z score</b>												
12	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>c</sup>	none <sup>j</sup>	6918	5381	-	MD <b>0.02 lower</b> (0.07 lower to 0.03 higher)	⊕○○○ Very low	IMPORTANT
<b>Fruit intake (dichotomous)</b>												
3	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>f</sup>	none	1252/2641 (47.4%)	1191/2995 (39.8%)	<b>RR 0.94</b> (0.87 to 1.02)	<b>24 fewer per 1,000</b> (from 52 fewer to 8 more)	⊕○○○ Very low	IMPORTANT
<b>Fruit intake (continuous)</b>												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Universal community engagement interventions	Comparison	Relative (95% CI)	Absolute (95% CI)		
3	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>g</sup>	none	254	223	-	SMD <b>0.03 SD lower</b> (0.24 lower to 0.17 higher)	⊕○○○ Very low	IMPORTANT
<b>Vegetable intake (dichotomous)</b>												
3	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>h</sup>	none	1486/2641 (56.3%)	1828/2995 (61.0%)	<b>RR 0.92</b> (0.89 to 0.96)	<b>49 fewer per 1,000</b> (from 67 fewer to 24 fewer)	⊕○○○ Very low	IMPORTANT
<b>Vegetable intake (continuous)</b>												
3	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>g</sup>	none	254	223	-	SMD <b>0.02 SD lower</b> (0.23 lower to 0.19 higher)	⊕○○○ Very low	IMPORTANT

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Universal community engagement interventions	Comparison	Relative (95% CI)	Absolute (95% CI)		
<b>Sugar-sweetened beverages (dichotomous)</b>												
4	randomised trials	very serious <sup>a</sup>	very serious <sup>c</sup>	serious <sup>d</sup>	not serious <sup>f</sup>	none	1843/2868 (64.3%)	2515/3432 (73.3%)	<b>RR 0.93</b> (0.82 to 1.05)	<b>51 fewer per 1,000</b> (from 132 fewer to 37 more)	⊕○○○ Very low	IMPORTANT
<b>Sugar-sweetened beverages (continuous)</b>												
3	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>g</sup>	none	671	563	-	<b>SMD 0.25 SD lower</b> (0.38 lower to 0.13 lower)	⊕○○○ Very low	IMPORTANT
<b>Moderate-to-vigorous physical activity (continuous)</b>												
4	randomised trials	very serious <sup>a</sup>	not serious <sup>b</sup>	serious <sup>d</sup>	not serious <sup>i</sup>	none	856	795	-	<b>SMD 0 SD lower</b> (0.10 lower to 0.1 higher)	⊕⊕○○ Low	IMPORTANT

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Universal community engagement interventions	Comparison	Relative (95% CI)	Absolute (95% CI)		
<b>Small screen time (dichotomous)</b>												
4	randomised trials	very serious <sup>a</sup>	very serious <sup>c</sup>	serious <sup>d</sup>	not serious <sup>f</sup>	none	1911/2804 (68.2%)	2547/3432 (74.2%)	<b>RR 0.95</b> (0.86 to 1.05)	<b>37 fewer per 1,000</b> (from 104 fewer to 37 more)	⊕○○○ Very low	IMPORTANT
<b>Electronic game time (dichotomous)</b>												
4	randomised trials	very serious <sup>a</sup>	very serious <sup>c</sup>	serious <sup>d</sup>	not serious <sup>f</sup>	none	1535/2804 (54.7%)	2183/3432 (63.6%)	<b>RR 0.93</b> (0.81 to 1.07)	<b>45 fewer per 1,000</b> (from 121 fewer to 45 more)	⊕○○○ Very low	IMPORTANT
Legend: <b>CI</b> = confidence interval; <b>MD</b> = mean difference; <b>RR</b> - risk ratio; <b>SMD</b> = standardized mean difference												

*Explanations*

- a. Almost all studies have unclear/high overall bias
- b. I-square statistics  $\leq 40\%$ , low heterogeneity
- c. I-square statistics  $\geq 75\%$ , considerable heterogeneity
- d. Universal pediatric populations were from different countries, undergoing different interventions of different durations
- e. No studies with small sample size, and only one study with wide CI (upper or lower limit crosses MD of 0.5 in either direction)

- f. No studies with small sample size and wide CI (upper or lower limit crosses RR of 0.25 in either direction)
- g. No studies with small sample size and wide CI (upper or lower limit crosses SMD of 0.5 in either direction)
- h. No studies with small sample size. Only one study with wide CI (upper or lower limit crosses RR of 0.25 in either direction)
- i. No studies with small sample size. Only one study with wide CI (upper or lower limit crosses SMD of 0.5 in either direction)
- j. Visual inspection of funnel plot indicates no observed pattern of publication bias