

**Research on the clustering behaviors among young people from low-, middle- and high-income countries: a scoping review**

**Table S1.** PRISMA-ScR checklist**Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist**

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	Page 1. Title.
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	Page 1
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	Page 3
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	Page 4
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Page 4. Topic Protocol.
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	Page 4. Topic Eligibility Criteria.
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	Page 4. Topic Protocol.
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Page 5. Supplementary material Table S2.

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	Page 6. Topic Data extraction and Synthesis.
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	Page 6. Topic Data extraction and Synthesis.
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	Page 6. Topic Data extraction and Synthesis.
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Page 7. Topic Critical appraisal of individual sources of evidence.
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	Page 6. Topic Data extraction and Synthesis.
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Page 9
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Page 9
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Page 10
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Page 6 to 14
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Page 10 to 14
<b>DISCUSSION</b>			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Page 14

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Limitations	20	Discuss the limitations of the scoping review process.	Page 18
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Page 19
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	Page 20

JB1 = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

\* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JB1 guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med*. 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).

**Table S2.** Search of all strategy

## PUBMED

Search Group	Search Terms
Physical Activity	sport* OR sports[mesh] OR sports OR "motor activity"[mesh] OR "motor activity" OR "physical activity" OR "physical activit*" OR exercise[mesh] OR exercise OR "exercise*" OR "physical exercise*" OR "exercise program*" OR "physical education" OR "physical fitness"[mesh] OR "physical fitness" OR "leisure time" OR "leisure activit*" OR "aerobic activity" OR "physical inactivity")
Sedentary Behavior	sedentarism OR sedentary OR "sedentary behavior" OR "sedentary behaviors" OR "sedentary behaviour" OR "sedentary behaviours" OR "sedentary lifestyle*" OR "sedentary lifestyle"[mesh] OR "sedentary lifestyle" OR television[mesh] OR television OR "television time" OR "television watch*" OR "TV watch*" OR "screen time" OR "screen viewing" OR "screen media" OR "media screen time" OR "time sitting" OR sitting OR "sitting time" OR computers[mesh] OR computers OR "computer time" OR "computer use" OR "video game*"
Diet Behavior	diet[mesh] OR diet OR "diet behavior" OR "diet behaviour" OR "diet consumption" OR "dietary intake" OR "unhealthy diet" OR "healthy diet"[mesh] OR "healthy diet" OR nutrition OR "food behavior" OR "feeding behavior"[mesh] OR "feeding behavior" OR "feeding behaviors" OR "feeding behaviour" OR "feeding behaviours" OR "eating behavior" OR "eating behaviors" OR "eating behaviour" OR "eating behaviours" OR "food consumption" OR "food choice" OR "food intake" OR "food habit" OR "food habits" OR "food preferences"[mesh] OR "food preferences" OR "unhealthy food" OR "nutritional quality"
Analysis	"cluster analysis"[mesh] OR "cluster analysis" OR cluster OR cluster* OR clustering OR co-occur OR co-occurrence OR "behavior pattern" OR "behavior patterns" OR "behaviour pattern" OR "behaviour patterns" OR "lifestyle pattern" OR "lifestyle patterns" OR "latent class" OR "factor analysis" OR "factorial analysis" OR simultaneity
Population	youth OR adolesce* OR adolescent[mesh] OR adolescent OR adolescent* OR adolescence OR student* OR students[mesh] OR students OR teen* OR teenage* OR schoolchildren OR child* OR child[mesh] OR child OR children[mesh] OR children

## Web of Science

Search Group	Search Terms
Physical Activity	TS=(sport* OR sports OR "motor activity" OR "physical activity" OR "physical activit*" OR exercise OR "exercise*" OR "physical exercise*" OR "exercise program*" OR "physical education" OR "physical fitness" OR "leisure time" OR "leisure activit*" OR "aerobic activity" OR recreation OR "physical inactivity")
Sedentary Behavior	TS=(sedentarism OR sedentary OR "sedentary behavior" OR "sedentary behaviors" OR "sedentary behaviour" OR "sedentary behaviours" OR "sedentary lifestyle*" OR "sedentary lifestyle" OR television OR "television time" OR "television watch*" OR "TV watch*" OR "screen time" OR "screen viewing" OR "screen media" OR "media screen time" OR "time sitting" OR sitting OR "sitting time" OR computers OR "computer time" OR "computer use" OR "video game*")
Diet Behavior	TS=(diet OR "diet behavior" OR "diet behaviour" OR "diet consumption" OR "dietary intake" OR "unhealthy diet" OR "healthy diet" OR nutrition OR "food behavior" OR "feeding behavior" OR "feeding behaviors" OR "feeding behaviour" OR "feeding behaviours" OR "eating behavior" OR "eating behaviors" OR "eating behaviour" OR "eating behaviours" OR "food consumption" OR "food choice" OR "food intake" OR "food habit" OR "food habits" OR "food preferences" OR "unhealthy food" OR "nutritional quality")
Analysis	TS=("cluster analysis" OR cluster OR cluster* OR clustering OR co-occur OR co-occurrence OR "behavior pattern" OR "behavior patterns" OR "behaviour pattern" OR "behaviour patterns" OR "lifestyle pattern" OR "lifestyle patterns" OR "latent class" OR "factor analysis" OR "factorial analysis" OR simultaneity)
Population	TS=(youth OR adolesce* OR adolescent OR adolescent* OR adolescence OR student* OR students OR teen* OR teenage* OR schoolchildren OR child* OR child OR children)

## SCOPUS

Search Group	Search Terms
Physical Activity	TITLE-ABS-KEY(sport* OR sports OR "motor activity" OR "physical activity" OR "physical activit*" OR exercise OR "exercise*" OR "physical exercise*" OR "exercise program*" OR "physical education" OR "physical fitness" OR "leisure time" OR "leisure activit*" OR "aerobic activity" OR recreation OR "physical inactivity")
Sedentary Behavior	TITLE-ABS-KEY(sedentarism OR sedentary OR "sedentary behavior" OR "sedentary behaviors" OR "sedentary behaviour" OR "sedentary behaviours" OR "sedentary lifestyle*" OR "sedentary lifestyle" OR television OR "television time" OR "television watch*" OR "TV watch*" OR "screen time" OR "screen viewing" OR "screen media" OR "media screen time" OR "time sitting" OR sitting OR "sitting time" OR computers OR "computer time" OR "computer use" OR "video game*")
Diet Behavior	TITLE-ABS-KEY(diet OR "diet behavior" OR "diet behaviour" OR "diet consumption" OR "dietary intake" OR "unhealthy diet" OR "healthy diet" OR nutrition OR "food behavior" OR "feeding behavior" OR "feeding behaviors" OR "feeding behaviour" OR "feeding behaviours" OR "eating behavior" OR "eating behaviors" OR "eating behaviour" OR "eating behaviours" OR "food consumption" OR "food choice" OR "food intake" OR "food habit" OR "food habits" OR "food preferences" OR "unhealthy food" OR "nutritional quality")
Analysis	TITLE-ABS-KEY("cluster analysis" OR cluster OR cluster* OR clustering OR co-occur OR co-occurrence OR "behavior pattern" OR "behavior patterns" OR "behaviour pattern" OR "behaviour patterns" OR "lifestyle pattern" OR "lifestyle patterns" OR "latent class" OR "factor analysis" OR "factorial analysis" OR simultaneity)
Population	TITLE-ABS-KEY(youth OR adolesce* OR adolescent OR adolescent* OR adolescence OR student* OR students OR teen* OR teenage* OR schoolchildren OR child* OR child OR children)

## LILACS, MEDLINE AND PSYCINFO

Search Group	Search Terms
Physical Activity	(sport OR sports OR "motor activity" OR "physical activity" OR "physical activities" OR exercise OR exercises OR "physical exercise" OR "exercise program*" OR "physical education" OR "physical fitness" OR "leisure time" OR "leisure activity" OR "leisure activities" OR "aerobic activity" OR recreation OR "physical inactivity")
Sedentary Behavior	(sedentarism OR sedentary OR "sedentary behavior" OR "sedentary behaviors" OR "sedentary behaviour" OR "sedentary behaviours" OR "sedentary lifestyles" OR "sedentary lifestyle" OR television OR "television time" OR "television watch" OR "television watches" OR "TV watch" OR "TV watching" OR "TC watches" OR "screen time" OR "screen viewing" OR "screen media" OR "media screen time" OR "time sitting" OR sitting OR "sitting time" OR computers OR "computer time" OR "computer use" OR "video game" OR "video games")
Diet Behavior	(diet OR "diet behavior" OR "diet behaviour" OR "diet consumption" OR "dietary intake" OR "unhealthy diet" OR "healthy diet" OR nutrition OR "food behavior" OR "feeding behavior" OR "feeding behaviors" OR "feeding behaviour" OR "feeding behaviours" OR "eating behavior" OR "eating behaviors" OR "eating behaviour" OR "eating behaviours" OR "food consumption" OR "food choice" OR "food intake" OR "food habit" OR "food habits" OR "food preferences" OR "unhealthy food" OR "nutritional quality")
Clustering	("cluster analysis" OR cluster OR cluster* OR clustering OR co-occur OR co-occurrence OR "behavior pattern" OR "behavior patterns" OR "behaviour pattern" OR "behaviour patterns" OR "lifestyle pattern" OR "lifestyle patterns" OR "latent class" OR "factor analysis" OR "factorial analysis" OR simultaneity)
Population	(youth OR adolesce* OR adolescent OR adolescent* OR adolescence OR student* OR students OR teen* OR teenage* OR schoolchildren OR child* OR child OR children)



**Table S3.** Behaviors included in clustering procedures along with physical activity, diet, and sedentary behavior.

<b>Author (year)</b>	<b>Behaviors included</b>
Androutsos et al. (2014)	Sleep.
Azeredo et al. (2016)	Aggression (intimidated and involved in a fight last 30d); Alcohol (frequency and glasses last 30d); Smoking (days last 30d); Drugs (use on last 30d); Unsafe sex (different people, use condom).
Bel-Serrat (2013)	None.
Berlin (2017)	Lose/gain weight.
Boone-Heinonen (2008)	Use of a community recreation center; Alcohol use; Smoking; Dieting or exercising to lose weight.
Busch (2013)	Alcohol use; Drug use; Smoking; Sexual behavior; Peer bullying.
Cameron (2011)	None.
Collese (2018)	Sleep time.
Cuenca-Garcia (2013)	None.
de Moraes (2016)	Sleep time.
Dantas (2018)	None.
Dumuid (2017)	None.
Dumuid (2017)	None.
Dumuid (2018)	Sleep.
Fernandez-Alvira (2013)	Sleep duration.
Ferrar (2015)	Sleep; Grooming; School activities.
Fleary (2017)	Unhealthy weight control; Sleep; Substance use (smoking, alcohol, binge drinking and marijuana)
Gubbels (2012)	None.
Gubbels (2012)	None.
Hartz (2018)	None.
Huh (2011)	Weight perception; Attitudes towards weight.
Iannotti (2013)	None.
Juresa (2012)	Family structure; Socio economic; Demographic characteristics; Alcohol and smoking; Teeth hygiene; Traffic safety; Physical conflicts; Health problems; Status and symptoms; Family medical history.
Kontogianni (2010)	None.
Lazzeri (2018)	Smoking; Alcohol; Violent behavior.
Laxer (2017)	Smoking; Alcohol; Marijuana.
Laxer (2018)	Smoking; Alcohol; Marijuana.
Leech (2014)	None.
Leech (2015)	None.
Lioret (2008)	None.
Magee et al. (2013)	Sleep duration; Sleeping/napping.

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Maia et al. (2018)	Eating with the parents/guardians; Eating in front of the TV or studying; Having breakfast.
Mandic et al. (2017)	Body Weight.
Marttila-Tornio (2019)	Alcohol use; Smoking
Matias (2018)	None.
Matias (2018)	None.
Miguel-Berges (2017)	Sleep.
Moreira (2018)	None.
Moschonis (2013)	Sleep
Moschonis (2012)	Sleep
Nuutinen (2017)	Sleep quality
Ottevaere (2011)	None.
Pereira (2015)	Sleep
Perez-Rodrigo (2015)	Sleep
Platat (2006)	None.
Riggs (2012)	Weight consciousness; Weight loss attempts; Exercising to lose weight.
Rodrigues (2017)	Father and mother PA level; Father and mother excess weight.
Santaliestra-Pasias (2015)	None.
Seghers (2010)	None.
Sena (2017)	Consumption of alcoholic beverages; Tobacco experimentation.
Spengler (2012)	None.
Spengler (2014)	None.
Turner (2011)	Alcohol.
Van der Sluis (2010)	None.
Veloso (2012)	None.
Yen (2006)	Smoking; Drinking alcohol; Chewing betel nut were; Brushing teeth before bed; Staying up late; Hitting others; Swearing; Breaking things when angry; Vandalism; Stealing; Cheating on an examination; Washing hands before eating.

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**Table S4.** Methodological Characteristics of included studies.

First Author	Study (year)	Sample Country	Sample (% of girls)	Age (range or mean)	PA (instrument)	Diet (instrument)	SB (instrument)	N. of behaviors	Cluster analysis
<b>High-Income Countries</b>									
Androustos (2014) <sup>1</sup>	Healthy								
	Growth Study (2007)	Greece	2.656 (50.1)	9-13	Questionnaire (Undefined)	24 hours recall	Questionnaire (Undefined)	12	PCA
Bel-Serrat (2013) <sup>2</sup>	IDEFICS (2007–2008)	Belgium, Cyprus, Estonia, Germany, Hungary, Italy, Spain, and Sweden.	4.619 (48.4)	2-9	Questionnaire (Undefined-Reproducible)	Questionnaire (Undefined-Reproducible)	Questionnaire (Undefined-Reproducible)	4	K-means*
Berlin (2017) <sup>3</sup>	ECLS-K (1998-1999) National Longitudinal Study of Adolescent Health (1995 and 1996) Not informed (2012)	U.S.A.	9.295 (49)	13-15	Questionnaire (Undefined)	Questionnaire (Undefined)	Questionnaire (Undefined)	21	LPA
Boone-Heinonen (2008) <sup>4</sup>	Study of Adolescent Health (1995 and 1996)	U.S.A.	8.840 (50.7)	11-21	Questionnaire (Sallis et al., 1999)	Questionnaire (Sallis et al., 1999)	Questionnaire (Sallis et al., 1999)	37	K-means
Busch (2013) <sup>5</sup>	Not informed (2012)	Netherlands	2.690 (55.0)	11-18	Questionnaire (adapted from the Dutch version of HBSC)	Questionnaire (adapted from the Dutch version of HBSC)	Questionnaire (adapted from the Dutch version of HBSC)	15	PCA & Two-steps

Cameron (2012) <sup>6</sup>	READI (2007-2008)	Australia	352	5-12	Objective Measure (Accelerometer)	Questionnaire (Undefined)	Questionnaire (Undefined)	4	Ward
		Austria, Belgium, France,							
Cuenca-García (2013) <sup>7</sup>	HELENA (2006-2007)	Greece, Germany, Hungary, Italy, Spain, and Sweden.	2.084 (54.0)	12-14	Questionnaire (IPAQ-A)	24 hours recall	Questionnaire (Undefined- Reproducible)	4	K- means*
Dumuid (2017) <sup>8</sup>	ISCOLE (2011-2012)	Australia  Belgium, Greece, Hungary,	284 (53.9)	9-11	Objective Measure (Accelerometer)	Questionnaire (FFQ)	Questionnaire (Undefined)	7	K- means*
Fernández-Alvira (2013) <sup>9</sup>	ENERGY- project (2010)	Netherlands, Norway, Slovenia, and Spain.	5.284 (54.0)	10-12	Questionnaire (ENERGY-child)	Questionnaire (ENERGY-child)	Questionnaire (ENERGY-child)	4	K- means*
	National Children's Nutrition and Physical Activity Survey (2007)	Australia	1.853 (49.8)	9-16	Questionnaire (Multimedia Activity Recall for Children and Adults)	Questionnaire (Food Model Booklet)	Questionnaire (Multimedia Activity Recall for Children and Adults)	24	Two- steps

Fleary (2017) <sup>11</sup>	YRBSS (2011)	U.S.A.	14.815 (49.0)	NR	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	15	LCA
Gubbels (2011) <sup>12</sup>	The KOALA Birth Cohort Study (2000)	Netherlands	2.074 (48.6)	5	Questionnaire (Standard Physical Activity)	Questionnaire (FFQ)	Questionnaire (Standard Physical Activity)	30	PCA
Gubbels (2012) <sup>13</sup>	The KOALA Birth Cohort Study (2000)	Netherlands	2.074 (48.6)	5	Questionnaire (Standard Physical Activity)	Questionnaire (FFQ)	Questionnaire (Standard Physical Activity)	13	PCA
Hartz (2018) <sup>14</sup>	NHANES (2003-2004) Pathways	U.S.A.	1.233 (48.5)	12-19	Objective Measure (Accelerometer)	24 hours recall	Objective Measure (Accelerometer)	3	LCA
Huh et al (2011) <sup>15</sup>	Study (Not informed)	U.S.A.	997 (48.1)	Mean: 9.6	Questionnaire (Undefined)	Questionnaire (Undefined)	Questionnaire (Undefined)	11	LCA
Iannotti and Wang (2013) <sup>16</sup>	Not informed (Not informed)	U.S.A.	9.206 (51.6)	Mean: 13.9	Questionnaire (Undefined- Reproducible)	Questionnaire (FFQ)	Questionnaire (Undefined- Reproducible)	10	LCA
Kontogianni (2010) <sup>17</sup>	Not informed (2007)	Greece	Children: 751 (49.0) Adolescents: 554 (56.0)	Children: 3-12 Adolescents: 13-18	Questionnaire (Undefined)	24 hours recall	Questionnaire (Undefined)	9	PCA
Landsberg (2010) <sup>18</sup>	KOPS (1996-2006)	Germany	1.894 (51.5)	Mean: 14.7	Questionnaire (Undefined)	Questionnaire (FFQ)	Questionnaire (Undefined)	7	Two- steps
Laxer (2017) <sup>19</sup>	COMPASS (2012-2013)	Canada	18.587 (48.9)	9-12	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	15	LCA
Laxer (2018) <sup>20</sup>	COMPASS (2012-2013)	Canada	5.084 (52.1)	Mean: 14.7	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	15	LCA

Lazzeri (2018) <sup>21</sup>	HBSC (2010)	Italy	3.291	11, 13 and 15	Questionnaire (HBSC)	Questionnaire (HBSC)	Questionnaire (HBSC)	22	EFA & K- means
Leech (2014) <sup>22</sup>	HEAPS (2002-2003)	Australia	Younger children: 362 (50.0) Older children: 610 (56.0)	Younger children: 5- 6 Older children: 10-12	Objective Measure (Accelerometer)	Questionnaire (FFQ)	Objective Measure (Accelerometer)	5	K- means
Leech (2015) <sup>23</sup>	HEAPS (2002-2003)	Australia	Younger children: 123 (46.0) Older children: 87 (43.0)	Younger children: 5- 6 Older children: 10, 12 & 14	Objective Measure (Accelerometer)	Questionnaire (FFQ)	Objective Measure (Accelerometer)	5	K- means
Lioret (2008) <sup>24</sup>	French INCA1 (1998-1999)	France	748	3-11	Questionnaire (Modifiable Activity Questionnaire)	7 days recall	Questionnaire (Modifiable Activity Questionnaire)	34	PCA
Magee (2013) <sup>25</sup>	LSAC (2006-2008)	Australia	1.833 (48.4)	6-9	Diares	Diares	Diares	6	LCA
Mandic (2017) <sup>26</sup>	BEATS (2014-2015)	New Zeland	1.300 (51.0)	13-18	Questionnaire (HBSC)	Questionnaire (HBSC)	Questionnaire (HBSC)	4	Two- steps
Marttila-Tornio (2019) <sup>27</sup>	Northen Finland Birth Cohort 1986	Finland	4.305 (53.0)	15-16	Questionnaire (NFBC1986)	Questionnaire (NFBC1986)	Questionnaire (NFBC1986)	7	K- means
Miguel-Berges (2017) <sup>28</sup>	ToyBox (2012)	Belgium, Bulgaria, Germany, Greece,	5.387 (49.0)	3.5-5.5	Objective Measure (Pedometer) & Questionnaire (Primary Caregivers Questionnaire)	Questionnaire (Primary Caregivers Questionnaire)	Questionnaire (Primary Caregivers Questionnaire)	6	K- means*

		Poland, and Spain							
Moschonis (2013) <sup>29</sup>	Healthy Growth Study (2007)	Greece	2.043 (50.2)	9-13	Questionnaire (Manios, Kafatos & Markakis, 1998)	24 hours recall	Questionnaire (Undefined)	12	PCA
Moschonis (2014) <sup>30</sup>	Healthy Growth Study (2007)	Greece	2.073 (50.2)	9-13	Questionnaire (Manios, Kafatos & Markakis, 1998)	24 hours recall	Questionnaire (Undefined)	12	PCA
Nuutinen (2017) <sup>31</sup>	HBSC (2010)	Finland	13 years: 2.152 15 years: 2.110	13 and 15	Questionnaire (HBSC)	Questionnaire (HBSC)	Questionnaire (HBSC)	9	K- means
Ottevaere (2011) <sup>32</sup>	HELENA (2006-2007)	Belgium, France, Greece, Germany, Italy, Spain, and Sweden.	2.084 (54.4)	Youngers: 12.5-14.9 Olders: 15-17.5	Questionnaire (IPAQ-A)	24 hours recall	Questionnaire (HELENA questionnaire)	3	K- means
Pereira (2015) <sup>33</sup>	ISCOLE (2011-2012)	Portugal	686 (55.5)	9.5-10.5	Objective Measure (Accelerometer)	Questionnaire (FFQ)	Questionnaire (YRBSS)	5	LCA
Pérez-Rodrigo (2015) <sup>34</sup>	ANIBES Study (2012)	Spain	415 (37.8)	9-17	Questionnaire (IPAQ-A)	24 hours recall	Questionnaire (HELENA questionnaire)	4	K- means*
Platat (2006) <sup>35</sup>	Not informed (2001)	France	2.724	12	Questionnaire (Modifiable Activity Questionnaire)	Questionnaire (Undefined)	Questionnaire (Modifiable Activity Questionnaire)	6	MCA
Riggs (2012) <sup>36</sup>	Pathways (Not informed)	U.S.A.	997 (51.9)	Mean: 9.3	Questionnaire (Undefined)	Questionnaire (Undefined)	Questionnaire (Undefined)	12	LCA

Rodrigues (2017) <sup>37</sup>	PPSOC (2009-2010)	Portugal	10.258 (51.0)	6-9	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	Questionnaire (Undefined- Reproducible)	15	PCA
		Belgium, Cyprus, Estonia,							
Santaliestra-Pasías (2015) <sup>38</sup>	IDEFICS (2007-2008)	Germany, Hungary, Italy, Spain, and Sweden.	11.674 (49.2)	2-9	Questionnaire (Undefined- Reproducible)	Questionnaire (CEHQ-FFQ)	Questionnaire (Undefined- Reproducible)	4	K- means*
	Not informed (2007)	Belgium	317 (56.8)	Mean: 11.7	Questionnaire (Flemish Physical Activity Questionnaire)	Questionnaire (FFQ)	Questionnaire (Undefined)	5	K- means
	KIGGS								
Spengler (2012) <sup>40</sup>	MoMo (2003-2006)	Germany	1.643 (49.4)	11-17	Questionnaire (MoMo-PAQ overall activity index)	Questionnaire (Adapted FFQ)	Questionnaire (Undefined)	3	K- means*
	KIGGS								
Spengler (2014) <sup>41</sup>	MoMo (2003-2006)	Germany	1.642 (49.4)	11-17	Questionnaire (MoMo-PAQ overall activity index)	Questionnaire (Adapted FFQ)	Questionnaire (Undefined)	3	K- means*
	Not informed (2005)	Canada	445 (60.2)	14-17	Questionnaire (SAPAC)	Questionnaire (adapted from the WHO Steps instrument)	Questionnaire (SAPAC)	7	Two- step
	Fruits and Vegetables								
Van der Sluis (2010) <sup>43</sup>	Make the Marks (2001-2005)	Norway	713 (53.0)	Not reported	Questionnaire (Undefined- Reproducible)	Questionnaire (Andersen et al., 2004)	Questionnaire (Undefined- Reproducible)	4	K- means



Veloso (2012) <sup>44</sup>	HBSC (2010)	Portugal	3.069 (54.1)	13-16.9	Questionnaire (HBSC)	Questionnaire (HBSC)	Questionnaire (HBSC)	8	K- means
Yen (2006) <sup>45</sup>	CABLE (2001)	Taiwan	2.075 (48.0)	Not reported	Questionnaire (CABLE)	Questionnaire (CABLE)	Questionnaire (CABLE)	18	PCA
<b>Upper-Middle Income Countries</b>									
Azeredo (2016) <sup>46</sup>	National Survey of School Health (2015)	Brazil	104.109 (52.2)	13-16	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	18	FA
Collese (2018) <sup>47</sup>	HELENA (2006-2007) BRACAH (2007) Health Education Program through Dietary Interventions and Physical Activity (2017) School Health Survey	Brazil	HELENA study: 1,252 (52.7) BRACAH study: 682 (54.2)	HELENA: 12.5–17.5 years (14.7) BRACAH: 14 to 17.5 years (16.3)	Questionnaire (IPAQ-A)	Questionnaire (FFQ)	Questionnaire (HELENA questionnaire)	5	K- means*
Dantas (2018) <sup>48</sup>	Dietary Interventions and Physical Activity (2017) School Health Survey	Brazil	578 (67.8)	12–18	Questionnaire (IPAQ-A)	Questionnaire (YRBSS)	Questionnaire (Undefined- Reproducible)	4	K- means*
Juresa (2012) <sup>49</sup>	School Health Survey	Croatia	960 (48.6)	Mean: 7.5	Questionnaire (School Health Survey)	Questionnaire (School Health Survey)	Questionnaire (School Health Survey)	41	EFA

(2003-2004)									
Maia (2018) <sup>50</sup>	PeNSE (2012)	Brazil	109.104 (52.2)	Younger than 13 and older tha 16	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	17	K- means
Matias (2018) <sup>51</sup>	PeNSE (2012)	Brazil	102.072	11-19	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	4	Two- steps
Matias (2018) <sup>52</sup>	PeNSE (2012)	Brazil	102.072 (51.3)	11-9 (14.3)	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	Questionnaire (PeNSE Questionnaire)	4	Two- steps
Sena (2017) <sup>53</sup>	Not informed	Brazil	1.716 (49.3)	10-17	Questionnaire (Undefined)	Questionnaire (FFQ)	Questionnaire (Undefined)	6	PCA
(2009-2011)									
<b>Intercontinental Studies with Different Income Countries</b>									
Dumuid (2016) <sup>54</sup>	ISCOLE (2011-2012)	Australia, Brazil, Canada, China, Colombia, England, Finland, India, Kenya, Portugal, South Africa, and USA	5.710	9-11	Objective Measure (Accelerometer)	Questionnaire (FFQ)	Objective Measure (Accelerometer)	9	K- means*
Dumuid (2017) <sup>55</sup>	ISCOLE (2011-2012)	Australia, Brazil,	5.759 (55.0)	9-11	Objective Measure (Accelerometer)	Questionnaire (FFQ)	Questionnaire (Undefined)	8	K- means*

		Canada,							
		China,							
		Colombia,							
		England,							
		Finland,							
		India,							
		Kenya,							
		Portugal,							
		South							
		Africa, and							
		USA.							
		HELENA:							
		Austria,							
		Belgium,							
		France,							
	HELENA	Greece,	HELENA study:	HELENA: 12-17.5					
	(2006-2007)		1.252 (52.7)						
Moraes (2016) <sup>56</sup>	BRACAH	Germany,	BRACAH study: 682		Questionnaire (IPAQ-A)	Questionnaire (HBSC)	Questionnaire (Undefined)	5	K- means*
	(2007)	Hungary,	(54.3)	BRACAH: 14-17.5					
		Italy, Spain,							
		and Sweden.							
		BRACAH:							
		Brazil.							
	HELENA	HELENA:	HELENA study:	HELENA: 12.5-17.7	HELENA:	HELENA: 24 hours recall	HELENA:		
	(2006-2007)	Austria,	2.057 (53.8)		Questionnaire (IPAQ-A)		Questionnaire (HELENA	4	K- means*
Moreira (2018) <sup>57</sup>	BRACAH	Belgium,	ELANA study: 968	ELANA: 13.5-19	ELANA:	ELANA:	questionnaire)		
	(2007)	France,	(53.2)		Questionnaire (IPAQ short version)	Questionnaire (FFQ)	ELANA:		

Greece,	Questionnaire (Undefined)
Germany,	
Hungary,	
Italy, Spain,	
and Sweden.	
BRACAH:	
Brazil.	

PA: physical activity; SB: sedentary behavior; NA: not applicable; NR: not reported; \*: With Wald's method; IDEFICS: Identification and prevention of Dietary and lifestyle-induced health Effects in children and InfantS; ECLS-K: Early Childhood Longitudinal Study Cohort; READI: Resilience for Eating and Activity Despite Inequality; HEAPS: Health, Eating and Play study; LSAC: Longitudinal Study of Australian Children; BEATS: Built Environment and Active Transport to School; Pathways: Pathways to Health; PPSOC: Portuguese Prevalence Study of Obesity in Childhood; BRACAH: Brazilian Cardiovascular Adolescent Health; CABLE: Child and Adolescent Behaviors in Long-term Evolution; ELANA: Adolescent Nutritional Assessment Longitudinal; ENERGY: European Energy balance Research to prevent excessive weight Gain among Youth; FFQ: Food Frequency Questionnaire; HBSC: Health Behavior in School-aged Children; HELENA: Healthy Lifestyle in Europe by Nutrition in Adolescence; IPAQ-A: International Physical Activity Questionnaire for Adolescents; MoMo: Motorik-Modul; PeNSE: National School-based Health Survey; SAPAC: Self-Administered Physical Activity Checklist YRBSS: Youth Risk Behavior Surveillance System.

EFA: Exploratory factor analysis; FA: Factor analysis; LCA: Latent class analysis; LPA: Latent profile analysis; MCA: Multiple correspondence analysis; PCA: Principal component analysis.

Equal superscript black letters indicate common samples.

**Table S5.** Assessment of the bias risk of studies.

Study	Selection bias		Study design				Assessment tool									Withdrawals and drop-outs		
							PA			Diet			SB					
	Q1	Bias	Q2	Q3	Q4	Bias	Q5	Q6	Bias	Q5	Q6	Bias	Q5	Q6	Bias	Q7	Q8	Bias
Androutsos (2014) <sup>1 a</sup>	0	Moderate	1	1	1	Strong	0	0	Weak	1	1	Strong	0	1	Weak	1	1	Strong
Azeredo (2016) <sup>46 b</sup>	1	Strong	1	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Weak	1	1	Strong
Bel-Serrat (2013) <sup>2 a</sup>	-1	Weak	1	1	0	Moderate	1	1	Strong	1	1	Strong	0	1	Weak	1	1	Strong
Berlin (2017) <sup>3 a</sup>	?	Weak	1	0	0	Moderate	0	1	Weak	0	1	Weak	0	1	Weak	0	1	Strong
Boone-Heinonen (2008) <sup>4 a</sup>	0	Moderate	1	1	0	Moderate	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Busch (2013) <sup>5 a</sup>	0	Moderate	0	1	-1	Weak	?	1	Weak	?	1	Weak	?	1	Weak	1	1	Strong
Cameron (2012) <sup>6 a</sup>	-1	Weak	0	1	1	Moderate	1	1	Strong	0	1	Weak	0	1	Weak	1	-1	Weak
Collese (2018) <sup>47 b</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	0	0/?	Weak
Cuenca-García (2013) <sup>7 a</sup>	-1	Weak	0	0	0	Weak	1	1	Strong	1	1	Strong	1	1	Strong	0	-1	Weak
Dantas (2018) <sup>48 b</sup>	-1	Weak	0	1	1	Moderate	1	1	Strong	1	1	Strong	0	1	Weak	0	0	Weak
Dumuid (2017) <sup>55</sup>	0	Moderate	0	1	*	Weak	1	1	Strong	1	1	Strong	0	1	Weak	1	1	Strong
Dumuid (2017) <sup>8 c</sup>	-1	Weak	0	1	1	Moderate	1	1	Strong	1	1	Strong	0	1	Weak	1	-1	Weak
Dumuid (2016) <sup>54 c</sup>	1	Strong	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Fernández-Alvira (2013) <sup>9 a</sup>	0	Moderate	1	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Weak	0	1	Strong
Ferrar and Golley (2015) <sup>10 a</sup>	1	Strong	0	-1	1	Weak	1	1	Strong	0	1	Weak	1	1	Strong	0	1	Strong
Fleary (2017) <sup>11 a</sup>	?	Weak	1	0	0	Moderate	0	1	Weak	0	1	Weak	0	1	Weak	1	1	Strong
Gubbels (2011) <sup>12 a</sup>	0	Moderate	0	1	-1	Weak	0	1	Weak	1	1	Strong	0	1	Weak	0	0	Moderate
Gubbels (2012) <sup>13 a</sup>	0	Moderate	0	1	-1	Weak	0	1	Weak	1	1	Strong	0	1	Weak	0	0	Moderate
Hartz (2018) <sup>14 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	0	1	Weak	1	1	Strong	1	0	Moderate

Huh et al (2011) <sup>15 a</sup>	?	Weak	0	-1	1	Weak	0	0	Weak	0	1	Weak	0	0	Weak	1	0	Moderate
Iannotti and Wang (2013) <sup>16 a</sup>	1	Strong	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong
Juresa (2012) <sup>49 b</sup>	1	Strong	1	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Weak	0	-1	Weak
Kontogianni (2010) <sup>17 a</sup>	1	Strong	1	1	1	Strong	0	1	Weak	1	1	Strong	0	1	Weak	0	1	Strong
Landsberg (2010) <sup>18 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak
Laxer (2017) <sup>19 a</sup>	-1	Weak	0	1	-1	Weak	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong
Laxer (2018) <sup>20 a</sup>	-1	Weak	0	1	-1	Weak	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak
Lazzeri (2018) <sup>21 a</sup>	1	Strong	1	1	1	Strong	0	1	Weak	1	1	Strong	0	0	Weak	0	?	Weak
Leech (2014) <sup>22 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Leech (2015) <sup>23 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak
Lioet (2008) <sup>24 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	0	1	Weak	1	1	Strong	1	1	Strong
Magee (2013) <sup>25 a</sup>	?	Weak	0	-1	1	Weak	0	1	Weak	0	1	Weak	0	1	Weak	0	?	Weak
Maia (2018) <sup>50 b</sup>	1	Strong	1	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Weak	1	1	Strong
Mandic (2017) <sup>26 a</sup>	-1	Weak	0	1	0	Weak	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Marttila-Tornio (2019) <sup>27 a</sup>	-1	Weak	1	1	-1	Weak	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak
Matias (2018) <sup>51 b</sup>	1	Strong	1	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Weak	1	1	Strong
Matias (2018) <sup>52</sup> body image <sup>b</sup>	1	Strong	1	1	1	Strong	1	1	Strong	0	1	Weak	0	1	Weak	1	1	Strong
Miguel-Berges (2017) <sup>28 a</sup>	0	Moderate	0	1	1	Moderate	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Moraes (2016) <sup>56 c</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Moreira (2018) <sup>57 c</sup>	1	Strong	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak
Moschonis (2013) <sup>29 a</sup>	0	Moderate	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Moschonis (2014) <sup>30 a</sup>	0	Moderate	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Nuutinen (2017) <sup>31 a</sup>	1	Strong	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	0	1	Strong
Ottevaere (2011) <sup>32 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak

Pereira (2015) <sup>33 a</sup>	1	Strong	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	0	?	Weak
Pérez-Rodrigo (2015) <sup>34 a</sup>	1	Strong	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	-1	Weak
Platat (2006) <sup>35 a</sup>	0	Moderate	1	1	1	Strong	1	1	Strong	0	1	Weak	1	1	Strong	1	0	Moderate
Riggs (2012) <sup>36 a</sup>	?	Weak	1	1	1	Strong	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Strong
Rodrigues (2017) <sup>37 a</sup>	-1	Weak	1	1	1	Strong	0	1	Weak	0	1	Weak	0	1	Weak	1	1	Strong
Santaliestra-Pasías (2015) <sup>38 a</sup>	0	Moderate	1	1	1	Strong	1	1	Strong	1	1	Strong	0	1	Weak	1	0	Moderate
Seghers and Rutten (2010) <sup>39 a</sup>	?	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong
Sena (2017) <sup>53 b</sup>	0	Moderate	1	1	1	Strong	1	1	Strong	1	1	Strong	0	1	Weak	1	0	Moderate
Spengler (2012) <sup>40 a</sup>	?	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong
Spengler (2014) <sup>41 a</sup>	?	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	0	Moderate
Turner (2011) <sup>42 a</sup>	?	Weak	0	1	-1	Weak	1	1	Strong	0	1	Weak	0	1	Weak	1	1	Strong
Van der Sluis (2010) <sup>43 a</sup>	1	Strong	1	1	1	Strong	0	1	Weak	1	1	Strong	0	1	Weak	1	1	Strong
Veloso (2012) <sup>44 a</sup>	0	Moderate	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	0	0	Moderate
Yen (2006) <sup>45 a</sup>	-1	Weak	1	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong	1	1	Strong

PA: physical activity; SB: sedentary behavior; Q1: Are the individuals selected to participate in the study likely to be representative of the target population?; Q2: Is there a description of the representativeness of the sample?; Q3: Was the sampling method described?; Q4: Was the method appropriate?; Q5: Is there a prior validation report of the tool?; Q6: Is there information that makes it possible to replicate the tool?; Q7: Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?; Q8: Indicate the percentage of participants completing the study; ?: impossible to determine; \*The selection method differed among study countries. <sup>a</sup>High-Income Countries; <sup>b</sup>Upper-Middle Income Countries; <sup>c</sup>Involves samples from more than one country and with different income classification (Intercontinental Studies with Different Income Countries).

**Table S6.** Articles from their respective studies.

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1. ISCOLE (1)	
	<ul style="list-style-type: none"> <li>• Dumuid (2016)</li> <li>• Dumuid (2017)</li> <li>• <b>Dumuid (2017) – Intercontinental – 5.759 – 9-11 – Children &amp; Adolescents (C&amp;A) – Australia, Brazil, Canada, China, Colombia, Finland, India, Kenya, Portugal, South Africa, England, USA.</b></li> <li>• Pereira (2015)</li> </ul>
2. HBSC – 11, 13, 15 – Adolescents (A)	
	<ul style="list-style-type: none"> <li>• <b>Lazzeri (2018) - Italy</b></li> <li>• <b>Nuutinen (2017) - Finland</b></li> <li>• <b>Veloso (2012) - Portugal</b></li> </ul>
3. HELENA	
	<ul style="list-style-type: none"> <li>• <b>Cuenca-García (2013) – European Countries – 2.084 – 12-14 – A</b></li> <li>• Moraes (2016)</li> <li>• Moreira (2018)</li> <li>• Ottevaere (2011)</li> <li>• Collese (2018)</li> </ul>
4. Healthy Growth Study (2007)	
	<ul style="list-style-type: none"> <li>• <b>Androutsos (2014) – Greece – 2.656 – 9-13 – C&amp;A</b></li> <li>• Moschonis (2012)</li> <li>• Moschonis (2013)</li> </ul>
5. HEAPS	
	<ul style="list-style-type: none"> <li>• <b>Leech (2014) – Australia – 972 – 5-6 &amp; 10-12 – C&amp;A</b></li> <li>• Leech (2015)</li> </ul>
6. IDEFICS	
	<ul style="list-style-type: none"> <li>• Bel-Serrat (2013)</li> <li>• <b>Santaliestra-Pasías (2015) – European Countries – 11.674 – 2-9 – Children (C)</b></li> </ul>
7. KIGGS/MoMo	
	<ul style="list-style-type: none"> <li>• <b>Spengler (2012) – Germany – 1.643 – 11-17 - A</b></li> <li>• Spengler (2014)</li> </ul>
8. KOALA Birth Cohort	
	<ul style="list-style-type: none"> <li>• <b>Gubbels (2011) – Netherlands – 2.074 – 5 – C</b></li> <li>• Gubbels (2012)</li> </ul>
9. Pathways to Health	
	<ul style="list-style-type: none"> <li>• <b>Huh (2011) – USA – 997 – 9.6 - C</b></li> <li>• Riggs (2012)</li> </ul>
10. PeNSE 2015	
	<ul style="list-style-type: none"> <li>• <b>Azeredo (2016) – Brazil – 104.109 – 13-16 or more - A</b></li> </ul>



- Matias (2018)
  - Matias (2018) – Body Image
11. 2011 YRBSS
    - Fleary (2017) – USA – 14.815 – Not reported (NR)
  12. ANIBES
    - Pérez-Rodrigo (2016) – Spain – 415 – 9-17 – C&A
  13. BEATS
    - Mandic (2017) – New Zeland – 1.300 – 13-18 - A
  14. BRACAH
    - **Moraes (2016) – Brazil – 682 – 14-17.5 – A**
    - Collese (2018)
  15. CABLE
    - Yen (2006) – Taiwan – 2.075 - NR
  16. COMPASS
    - **Laxer (2017) – Canada – 18.587 – 9-12 – C&A**
    - Laxer (2018)
  17. ECLS-K
    - Berlin (2015) – USA – 9.295 – 13-15 - A
  18. ELANA
    - Moreira (2018) – Brazil – 968 – 13.5-19 - A
  19. ENERGY
    - Fernández-Alvira (2013) – European Countries – 5.284 – 10-12 - A
  20. French INCA1
    - Lioret (2008) – France – 748 – 3-11 – C&A
  21. Fruits & Vegetables Make the Marks
    - Van Der Sluis (2010) – Norway – 713 - NR
  22. KOPS
    - Landsberg (2010) – Germany – 1.894 – 14.7 - A
  23. LSAC
    - Magee (2013) – Australia – 1.833 – 6-9 - C
  24. National Children's Nutrition and PA Survey
    - Ferrar (2015) – Australia – 1.853 – 9-16 – C&A
  25. National Longitudinal Study of Adolescent Health
    - Boone-Heinonen – USA – 8.840 – 11-21 - A
  26. NHANES
    - Hartz (2018) – USA – 1.233 – 12-19 - A
  27. PeNSE 2012
    - Maia (2017) – Brazil – 109.104 - <13 & >16 - A
  28. PPSOC
    - Rodrigues (2017) – Portugal – 10.258 – 6-9 - C

## 29. READI

- Cameron (2011) – Australia – 352 – 5-12 – C&A

## 30. School Health Survey

- Juresa (2012) – Croatia – 960 – 7.5 - C

## 31. ToyBox

- Miguel-Berges (2017) – European Countries – 5.387 – 3.5-5.5 - C

## 32. Article that did not presented the study name: 1

- Busch (2013) – Netherlands – 2.690 – 11-18 - A

## 33. Article that did not presented the study name: 2

- Iannotti (2013) – USA – 9.206 – 13.9 - A

## 34. Article that did not presented the study name: 3

- Kontogianni (2010) – Greece – 1.305 – 3-18 – C&A

## 35. Article that did not presented the study name: 4

- Platat (2006) – France – 2.724 – 12 - A

## 36. Article that did not presented the study name: 5

- Seghers (2010) – Belgium – 317 – 11.7 - A

## 37. Article that did not presented the study name: 6

- Sena (2017) – Brazil – 1.716 – 10-17 - A

## 38. Article that did not presented the study name: 7

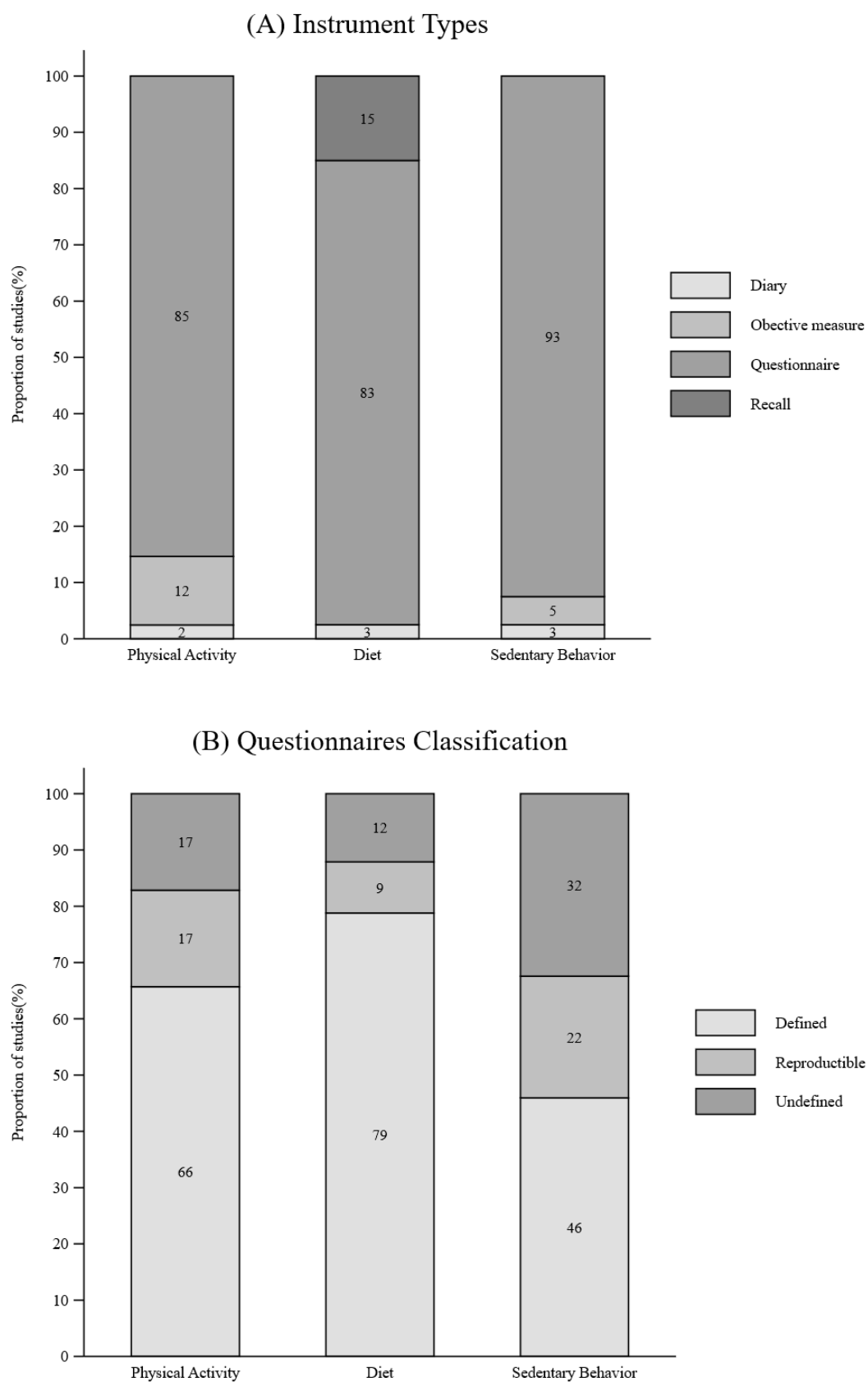
- Turner (2011) – Canada – 445 – 14-17 – A

## 39. Health Education Program through Dietary Interventions and Physical Activity

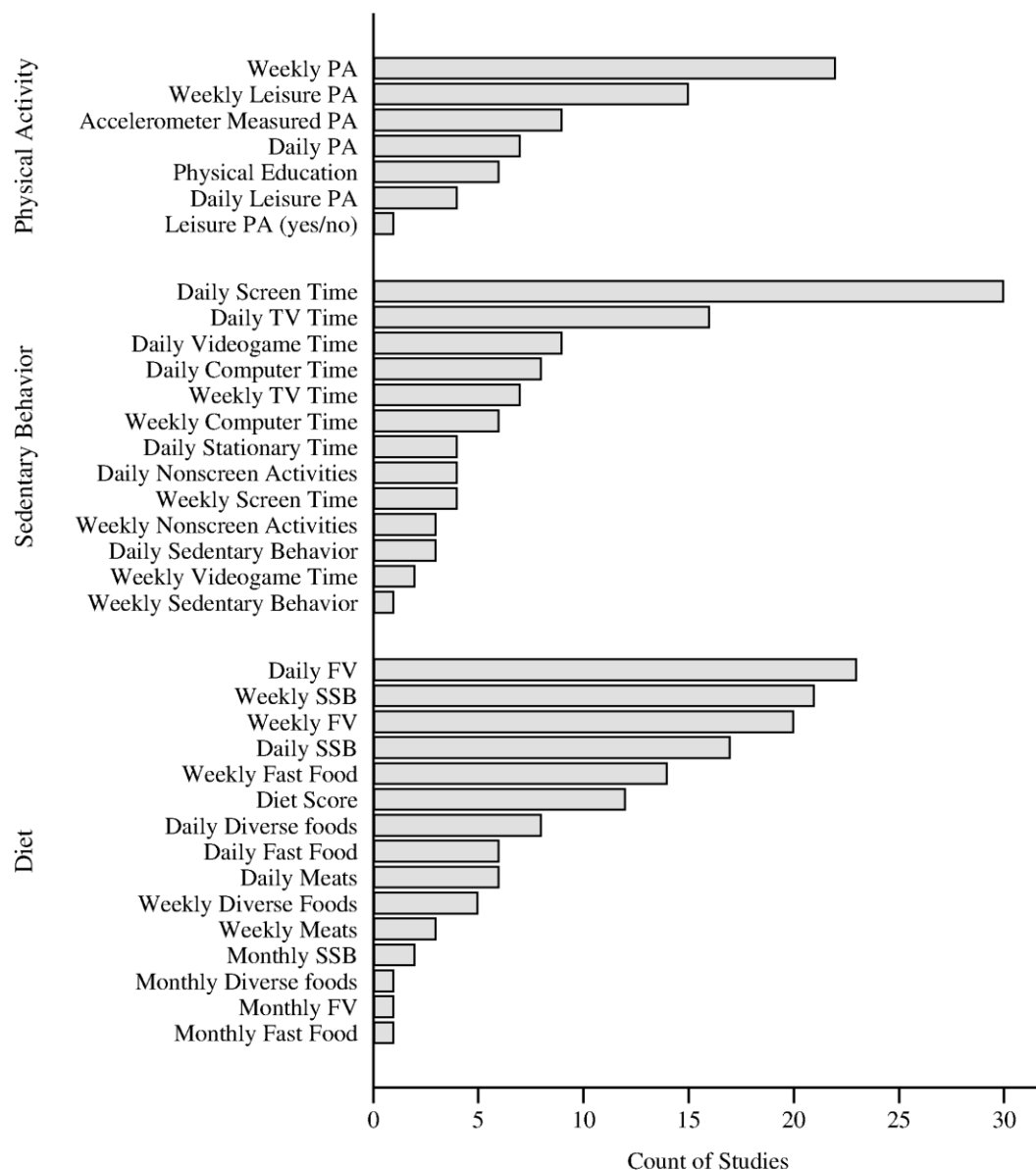
- Dantas (2018) – Brazil – 578 – 12-18 – A

## 40. Northern Finland Birth Cohort 1986 (NFBC1986)

- Marttila-Tornio (2019) – Finland – 4.305 – 15-16 – A
-

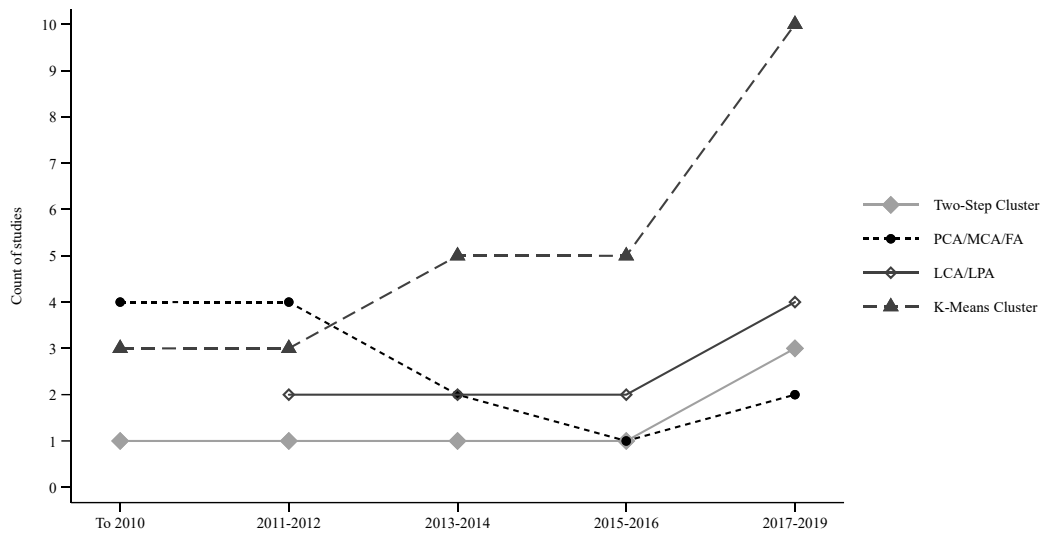


**Figure S1.** Instruments used and questionnaires classification according to each behavior.



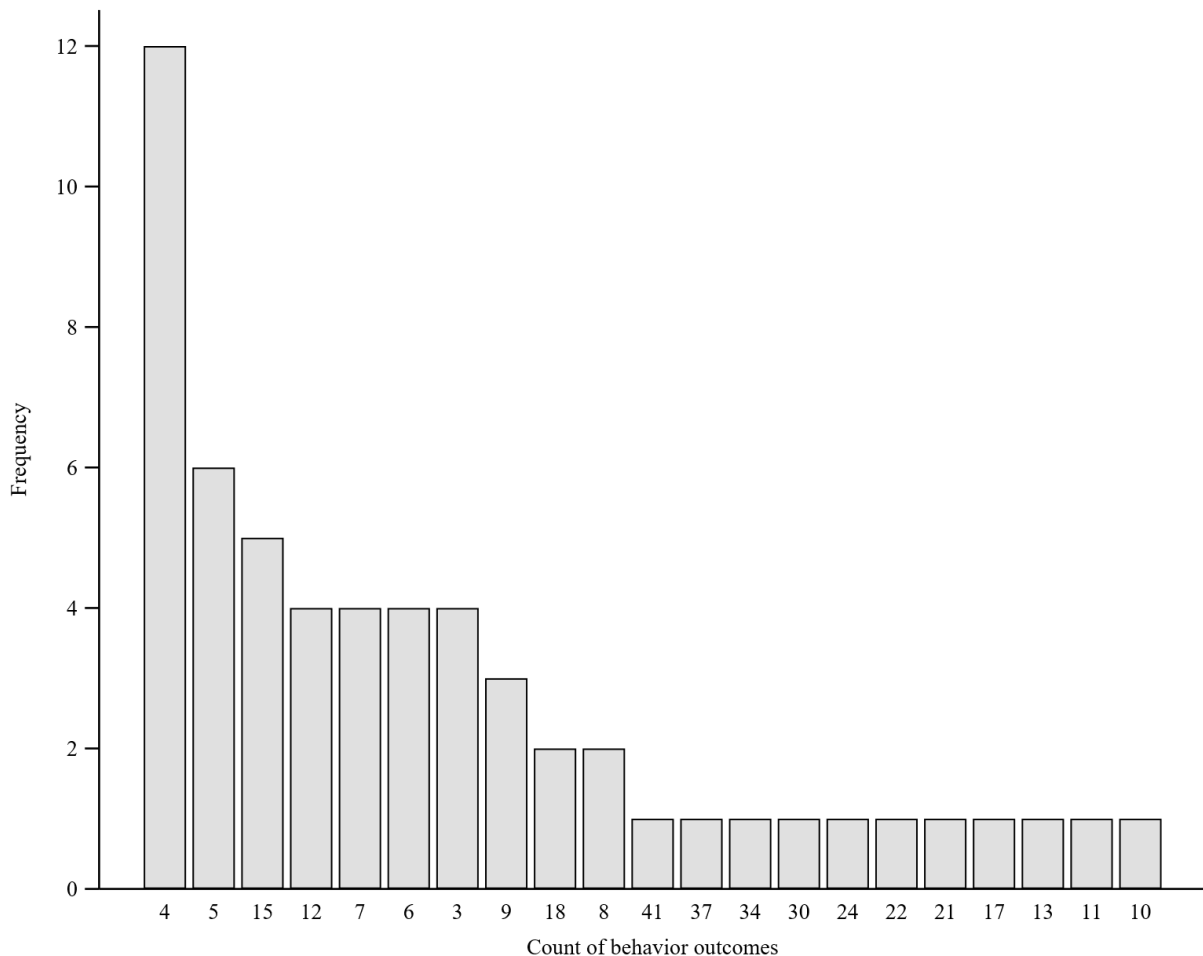
**Figure S2.** Behavioral outcomes used to define PA, diet, and sedentary behavior in clustering procedures.

Note: FV: fruits and/or vegetables; SSB: salty and sugary snacks, and/or sweetened beverages. \*Stationary time refers to accelerometer measured movement behaviors.



**Figure S3.** Use of statistical procedures to evaluate the clustering between physical activity, diet and sedentary behavior among children and adolescents.

Note: LCA: Latent Class Analysis; LPA: Latent Profile Analysis; PCA: Principal Component Analysis; MCA: Multiple corresponding analysis; FA: Factorial Analysis.



**Figure S4.** Quantity of outcomes used in clusters procedures.

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