Supplementary Material
### Sup. Table 1. PRISMA Checklist [1]

| Section/topic          | # | Checklist item                                                                                                                                                                                                                                                                                                                                 | Reported on page # |
|------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| **TITLE**              |   |                                                                                                                                                                                                                                                                                                                                                                                                           |                   |
| Title                  | 1 | Identify the report as a systematic review, meta-analysis, or both.                                                                                                                                                                                                                                                                         | Page 1; lines 1-2 |
| **ABSTRACT**           |   |                                                                                                                                                                                                                                                                                                                                                                                                           |                   |
| Structured summary     | 2 | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.                                                                                                    | Page 2; lines 2-18|
| **INTRODUCTION**       |   |                                                                                                                                                                                                                                                                                                                                                                                                           |                   |
| Rationale              | 3 | Describe the rationale for the review in the context of what is already known.                                                                                                                                                                                                                                                               | Pages 3 and 4     |
| Objectives             | 4 | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).                                                                                                                                                                                       | Page 4; lines 15-22|
| **METHODS**            |   |                                                                                                                                                                                                                                                                                                                                                                                                           |                   |
| Protocol and registration | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.                                                                                                                                                                         | Page 5; lines 1-3  |
| Eligibility criteria   | 6 | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.                                                                                                                                                                         | Page 5; lines 4-13 |
| Information sources    | 7 | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.                                                                                                                                                                                   | Page 5; line 14-18|
| Search                 | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.                                                                                                                                                                                                                 | Page 5; line 19-25|
|                        |   | Supplementary Table 2                                                                                                                                                                                                                                                                                                                                                                                    |                   |
| Study selection        | 9 | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).                                                                                                                                                                                            | Page 3; line 25, 26|
| Data collection process| 10| Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.                                                                                                                                                                                     | Page 4; lines 1-7  |
| Data items             | 11| List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.                                                                                                                                                                                                         | Page 7; lines 5-13 |
| Risk of bias in individual studies | 12| Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.                                                                                                                                 | Page 6; lines 7-14 |
| Summary measures | 13 | State the principal summary measures (e.g., risk ratio, difference in means). | Page 6; lines 15-25 |
|------------------|----|------------------------------------------------------------------------|---------------------|
| Synthesis of results | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I²) for each meta-analysis. | Page 6; lines 15-25 |
| Risk of bias across studies | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | Page 7; lines 1-4 |
| Additional analyses | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | Page 7; lines 1-4 |

**RESULTS**

| Study selection | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | Page 7; line 15, 17 |
| Study characteristics | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | Page 7; lines 18-26; Page 8; lines 1-14; Tables 1-3 |
| Risk of bias within studies | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | Sup. Table 3 |
| Results of individual studies | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. | Figure 2 and 3 Page 8; lines 21-26 Page 9; lines 1-12 |
| Synthesis of results | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency. | Figure 2 and 3 |
| Risk of bias across studies | 22 | Present results of any assessment of risk of bias across studies (see Item 15). | Sup. Figure 1 Page 8; lines 16-20 |
| Additional analysis | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]). | Figure S1 |

**DISCUSSION**

| Summary of evidence | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | Pages 9; lines 14-17 |
| Limitations | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). | Page 11; lines 13-17 |
| Conclusions | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | Page 11; lines 18-23 |
| Funding | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | Page 11; lines 24-25 |
### Sup. Table 2. Search strategies and the number of records according to different electronic database

| Search strategy                                                                 | Database | Num. of records |
|--------------------------------------------------------------------------------|----------|-----------------|
| (((((((((obesity[MeSH Terms]) OR (central obesity[MeSH Terms])) OR (overweight[MeSH Terms])) OR (body mass index[MeSH Terms])) OR (abdominal obesity[MeSH Terms])) OR (overweight[MeSH Terms])) OR (waist circumference[MeSH Terms])) OR (ratio, waist to hip[MeSH Terms])) OR (body fat distribution[MeSH Terms])) OR (abdominal fat[MeSH Terms])) OR (body composition[MeSH Terms])) AND (((((((((sedentary behav*[MeSH Terms]) OR (screen time[MeSH Terms])) OR (sitting time[MeSH Terms])) OR (television view*[MeSH Terms])) OR (computer use[MeSH Terms])) OR (internet use[MeSH Terms])) OR (smart phone[MeSH Terms])) OR (video game*[MeSH Terms])) OR (electronic game*[MeSH Terms])) OR (depress*[MeSH Terms]))) AND (((((((((Child*[MeSH Terms]) OR (children[MeSH Terms])) OR (teen*[MeSH Terms])) OR (adolescent[MeSH Terms])) OR (boy*[MeSH Terms])) OR (girl[MeSH Terms])) OR (all, childhood[MeSH Terms])) OR (pediatric*[MeSH Terms])) OR (youth[MeSH Terms])) OR (teenager[MeSH Terms])) OR (toddler*[MeSH Terms])) | PubMed   | 2121            |
|                                                                                | Scopus    | 2016            |
|                                                                                | Embase    | 2154            |
## Sup. Table 3. Agency for Healthcare Research and Quality (AHRQ) checklist to assess quality of the cross-sectional studies

| ARHQ Methodology Checklist items for Cross-Sectional study | Hoffmann B [2] | Tsuchiya M [3] | Kelishadi R [4] | Alghadir AH [5] | Al-Agha AE [6] | Stamatakis E [7] | Hardy LL [8] | Cheng L [9] | Elizondo-MontemayorL [10] |
|----------------------------------------------------------|----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|--------------------------|
| 1) Define the source of information (survey, record review) |⊕               |⊕              |⊕               |⊕               |⊕              |⊕              |⊕              |⊕              |⊕                        |
| 2) List inclusion and exclusion criteria for exposed and unexposed subjects (cases and controls) or refer to previous publications |⊕               |⊕              |⊕               | -              |⊕              |⊕              |U              |⊕              |-                        |
| 3) Indicate time period used for identifying patients |-              |⊕              |⊕               |⊕              |⊕              |⊕              |⊕              |⊕              |⊕                        |
| 4) Indicate whether or not subjects were consecutive if not population-based |⊕               |-              |-               |-              |-              |-              |⊕              |-              |-                        |
| 5) Indicate if evaluators of subjective components of study were masked to other aspects of the status of the participants |U              |⊕              |⊕               |-              |-              |-              |U              |-              |-                        |
| 6) Describe any assessments undertaken for quality assurance purposes (e.g., test/retest of primary outcome measurements) |-              |-              |-               |-              |-              |-              |-              |⊕              |-                        |
| 7) Explain any patient exclusions from analysis |-              |⊕              |⊕               |⊕              |⊕              |⊕              |⊕              |⊕              |⊕                        |
| 8) Describe how confounding was assessed and/or controlled. |⊕               |⊕              |⊕               |⊕              |-              |⊕              |⊕              |⊕              |⊕                        |
| 9) If applicable, explain how missing data were handled in the analysis |-              |⊕              |⊕               |⊕              |⊕              |⊕              |⊕              |⊕              |⊕                        |
| 10) Summarize patient response rates and completeness of data collection |⊕               |⊕              |⊕               |-              |⊕              |⊕              |⊕              |⊕              |⊕                        |
| 11) Clarify what follow-up, if any, was expected and the percentage of patients for which incomplete data or follow-up was obtained |-              |-              |-               |-              |-              |-              |-              |-              |-                        |
| Total score |5               |8              |7               |5              |5              |7              |7              |8              |5                        |
Sup. Table 3. Cont’d

| ARHQ Methodology Checklist items for Cross-Sectional study | Werneck AO [11] | Suchert V [12] | Börnhorst C [13] | Canan F [14] | Appelhans BM [15] | Ghavamzadeh S [16] | Delong AJ [17] | Safiri S [18] | Christofaro DGD [19] |
|----------------------------------------------------------|-----------------|----------------|-------------------|---------------|-------------------|-------------------|-----------------|---------------|---------------------|
| 1) Define the source of information (survey, record review) | ⊗              | ⊗              | ⊗                 | ⊗             | ⊗                 | ⊗                 | ⊗               | ⊗             | ⊗                   |
| 2) List inclusion and exclusion criteria for exposed and unexposed subjects (cases and controls) or refer to previous publications | -              | ⊗              | ⊗                 | ⊗             | ⊗                 | ⊗                 | ⊗               | ⊗             | ⊗                   |
| 3) Indicate time period used for identifying patients | ⊗              | ⊗              | ⊗                 | ⊗             | ⊗                 | ⊗                 | ⊗               | ⊗             | ⊗                   |
| 4) Indicate whether or not subjects were consecutive if not population-based | -              | -              | -                 | -             | -                 | -                 | -               | -             | ⊗                   |
| 5) Indicate if evaluators of subjective components of study were masked to other aspects of the status of the participants | -              | U              | U                 | U             | U                 | -                 | U               | U             | U                   |
| 6) Describe any assessments undertaken for quality assurance purposes (e.g., test/retest of primary outcome measurements) | ⊗              | -              | -                 | -             | -                 | -                 | -               | U             | U                   |
| 7) Explain any patient exclusions from analysis | ⊗              | ⊗              | ⊗                 | ⊗             | ⊗                 | ⊗                 | ⊗               | ⊗             | ⊗                   |
| 8) Describe how confounding was assessed and/or controlled. | ⊗              | ⊗              | ⊗                 | ⊗             | ⊗                 | ⊗                 | ⊗               | ⊗             | ⊗                   |
| 9) If applicable, explain how missing data were handled in the analysis | -              | ⊗              | ⊗                 | ⊗             | ⊗                 | -                 | ⊗               | -             | U                   |
| 10) Summarize patient response rates and completeness of data collection | ⊗              | ⊗              | ⊗                 | ⊗             | ⊗                 | -                 | ⊗               | -             | ⊗                   |
| 11) Clarify what follow-up, if any, was expected and the percentage of patients for which incomplete data or follow-up was obtained | -              | -              | -                 | -             | -                 | -                 | -               | -             | U                   |

5 7 7 7 7 5 7 6 5
## Sup. Table 3. Cont’d

| ARHQ Methodology Checklist items for Cross-Sectional study | Asplund KM [20] | Hendrix KS [21] | Berentzen NE [22] | Shriver L [23] | Vrijkotte TGM [24] | Danielsen YS [25] | Kerkadi A [26] | Elgar FJ [27] | Elgar FJ [28] |
|-----------------------------------------------------------|----------------|----------------|-------------------|---------------|-------------------|-----------------|--------------|-------------|-------------|
| 1) Define the source of information (survey, record review) | ⊕             | ⊕             | ⊕                 | ⊕             | ⊕                 | ⊕               | ⊕            | ⊕           | ⊕           |
| 2) List inclusion and exclusion criteria for exposed and unexposed subjects (cases and controls) or refer to previous publications | ⊕             | ⊕             | ⊕                 | ⊕             | ⊕                 | ⊕               | ⊕            | ⊕           | ⊕           |
| 3) Indicate time period used for identifying patients | ⊕             | ⊕             | ⊕                 | ⊕             | ⊕                 | ⊕               | ⊕            | ⊕           | ⊕           |
| 4) Indicate whether or not subjects were consecutive if not population-based | -             | -             | -                 | -             | ⊕                 | ⊕               | -            | -           | -           |
| 5) Indicate if evaluators of subjective components of study were masked to other aspects of the status of the participants | U             | U             | -                 | U             | U                 | U               | -            | -           | -           |
| 6) Describe any assessments undertaken for quality assurance purposes (e.g., test/retest of primary outcome measurements) | ⊕             | -             | -                 | -             | -                 | -               | U            | -           | -           |
| 7) Explain any patient exclusions from analysis | ⊕             | -             | ⊕                 | ⊕             | ⊕                 | ⊕               | -            | ⊕           | ⊕           |
| 8) Describe how confounding was assessed and/or controlled. | ⊕             | ⊕             | ⊕                 | ⊕             | ⊕                 | ⊕               | ⊕            | ⊕           | ⊕           |
| 9) If applicable, explain how missing data were handled in the analysis | ⊕             | -             | ⊕                 | ⊕             | ⊕                 | ⊕               | -            | ⊕           | ⊕           |
| 10) Summarize patient response rates and completeness of data collection | ⊕             | ⊕             | ⊕                 | ⊕             | ⊕                 | ⊕               | ⊕            | ⊕           | ⊕           |
| 11) Clarify what follow-up, if any, was expected and the percentage of patients for which incomplete data or follow-up was obtained | -             | -             | -                 | -             | -                 | -               | ⊕            | -           | ⊕           |
| | 8             | 5             | 7               | 7               | 8               | 8               | 7             | 8           | 8           |
Sup. Figure 1. Begg's funnel plot (with pseudo 95% CIs) of the comparison of BMI between highest versus lowest screen time categories (A); the comparison of screen time (ST) between obese versus non-obese youth (B); odds of screen addiction among obese versus non-obese youth (C).
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