Supplementary Information

**Physical activity and sedentary behaviour in the Middle East and North Africa: An overview of systematic reviews and meta-analysis**

Sonia Chaabane¹, Karima Chaabna¹, Amit Abraham¹, Ravinder Mamtni¹, Sohaila Cheema¹

AUTHORS AFFILIATION AND ADDRESS

¹Institute for Population Health, Weill Cornell Medicine-Qatar
Qatar Foundation - Education City
P.O.Box : 24144
Doha - Qatar
Table S1. The 2009 PRISMA checklist for reporting a systematic review.

| Section/topic | # | Checklist item                                                                                                                                                                                                 | Reported on page # |
|---------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| **TITLE**     |   |                                                                                                                                                                                                              |                   |
| Title         | 1 | Identify the report as a systematic review, meta-analysis, or both.                                                                                                                                             | 1                 |
| **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. | 2                 |
| **INTRODUCTION** |   |                                                                                                                                                                                                              |                   |
| Rationale     | 3 | Describe the rationale for the review in the context of what is already known.                                                                                                                                  | 3                 |
| Objectives    | 4 | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).                                                      | 3                 |
| **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.                                          | 4                 |
| 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.                      | 5                 |
| 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.                                         | 4                 |
| Search        | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.                                                                                | 4                 |
| 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).                                                      | 5                 |
| 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.                                             | 5                 |
| Data items    | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.                                                                     | 5-7               |
| 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. | 9 Table S7       |
| **Summary measures** | 13 | State the principal summary measures (e.g., risk ratio, difference in means).                                                                                                                                   | 6-8               |
| **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.                                                      | 6-8               |
| Section/topic                        | #  | Checklist item                                                                                                                                                                                                 | Reported on page # |
|-------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 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).                                                          | 9                 |
| Additional analyses                 | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.                                                               | 9                 |
| **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.                                        | 10, 34            |
| 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.                                                                   | 10-13 Tables S8-11|
| 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).                                                                                                   | 10 Tables S8-11   |
| 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. | 10-14 Tables S8-11|
| Synthesis of results                | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency.                                                                                                    | 10-14 Tables 2-3  |
| Risk of bias across studies         | 22 | Present results of any assessment of risk of bias across studies (see Item 15).                                                                                                                                | Table 4           |
| Additional analysis                 | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).                                                                                       | Tables 2-3 Figure 2|
| **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).                        | 15-18 Tables 6-7  |
| 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).                                            | 18-19             |
| Conclusions                         | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research.                                                                                      | 19                 |
| **FUNDING**                         |    |                                                                                                                                                                                                            |                   |
| 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.                                                                   | 20                 |

Source: Moher D, et al 2009
Available at: http://www.prisma-statement.org/documents/PRISMA%202009%20checklist.pdf
Table S2. PRIO-harms checklist for reporting an overview of systematic reviews (OoSRs).

| Section/topic | (Sub-)item# | Checklist item                                                                                                                                                                                                                                                                                                                                 | Reported on page# |
|---------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Title 1. Title| 1a         | Specify the study design with terms such as “overview of (systematic) reviews,” “umbrella review,” “(systematic) review of systematic reviews,” or “(systematic) meta-review” in the title of the OoSRs.                                                                                                                   | 1                |
|               | 1b         | Mention “safety” or harms related terms, or the adverse event(s) of interest in the title of the OoSRs.                                                                                                                                                                                                                                      | N/A              |
| Abstract      | 2a         | Provide a structured-like abstract, as applicable: background, objective, data sources, selection criteria, data extraction, review appraisal, data synthesis methods, results, limitations, conclusions.                                                                                                                               | 2                |
|               | 2b         | Report the main findings of analysis of harms undertaken in the OoSRs or/and in the included SRs.                                                                                                                                                                                                                                          | 2                |
| Introduction  | 3a         | Specify the rationale and the scope (wide or narrow agendas) for the overview in the context of an existing body of knowledge on the topic.                                                                                                                                                                                                   | 3                |
|               | 3b         | Provide a balanced presentation of potential benefits and harms of the intervention(s).                                                                                                                                                                                                                                                    | 3                |
|               | 3c         | Define which events are considered harms according to previous literature and provide a clear rationale for the specific harms included in the OoSRs.                                                                                                                                                                               | 3                |
| 4. Objectives (PICOS) | 4         | Provide an explicit statement of research question(s) that specifies PICOS: *Participants *Interventions *Comparators *Outcomes *Study design                                                                                                                                                                                                 | 3                |
| Methods       | 5a         | Indicate if a protocol exists or not.                                                                                                                                                                                                                                                                                                    | 4                |
|               | 5b         | If registered, provide the name of the registry (such as a valid Web address, PROSPERO).                                                                                                                                                                                                                                                  | 4                |
| 6. Eligibility criteria and outcomes of interest | 6a         | Specify inclusion and exclusion criteria for study design, participants, interventions, and comparators in detail.                                                                                                                                                                                                                     | 4-5              |
|               | 6b         | List (and define whenever it is necessary) the outcomes for which data were recorded, ideally include prioritization of main and additional outcomes.                                                                                                                                                                                          | 4-5              |
|               | 6c         | Include adverse events as (primary or secondary) outcome of interest. Define them and grade their severity (such as mild, moderate, severe, fatal; severity could also be described in the appendix), if appropriate.                                                                                                                    | 4-5              |
|               | 6d         | Specify report characteristics (such as language restrictions, publication status, and years considered) used as criteria for eligibility for the OoSRs (see also item 7).                                                                                                                                                             | 4-5              |
| 7. Information sources | 7a        | Search at least two electronic databases.                                                                                                                                                                                                                                                                                               | 4                |
|               | 7b         | Search supplementary sources (e.g., hand searching, reference lists, related reviews and guidelines, protocol registries, conference abstracts, and other gray literature).                                                                                                                                                           | 4                |
|               | 7c         | Report the date of last search and/or dates of coverage for each database.                                                                                                                                                                                                                                                                  | 4                |
| 8. Search strategy | 8a        | Specify full electronic search strategy (algorithm) for at least one database including any limits used (e.g., language and date restrictions-see also subitems 6d and 7c) such that it could be repeated.                                                                                                                         | Published in the protocol |
| 8b | Present any additional search process (e.g., algorithm or filter for adverse events, searches in pertinent websites) specifically to identify adverse events that have been investigated. | Published in the protocol |
| --- | --- | --- |
| 9a | Describe the software that was used to manage records and data throughout the OoSRs. | 4-5 |
| 9b | Define what is an SR and provide the process for selecting SRs and its relevant details (screening the title and abstract or full text by at least two reviewers, selection by multiple independent investigators and resolving disagreements by consensus). | 4-5 |
| 9c | Report any attempt to handle overlapping (include one review among multiple potential candidates by choosing for example the most updated SR, the most methodologically rigorous SR or the SR with larger number of primary studies). | 4-5 |
| 10 | Report additional search to identify eligible primary studies (e.g., searching in more databases or update the search) and its relevant details. | No |
| 11a | Describe the method of data extraction from included SRs (e.g., data collection form, extraction in duplicate and independently, resolving disagreements by consensus). | 4-5 |
| 11b | Report any processes for obtaining, confirming, or updating data from investigators (e.g., contact with authors of included reviews, obtain data from primary studies of included reviews). | 4-5 |
| 12 | List (and define whenever is necessary) the variables for which data were recorded (e.g., PICOS items, number of included studies and participants, dose, length of follow up, results, funding sources) and any data assumptions and simplifications made. | 4-5 |
| 13a | State the evaluation of reporting or/and methodological quality (e.g., using PRISMA or PRISMA-harms, AMSTAR or R-AMSTAR) of the included reviews. | 9 Table S7 |
| 13b | State the evaluation of quality for individual studies that are included in the SRs (inform whether tools such as Jadad or RoB of Cochrane were used by the included reviews) and for the additional primary studies. | 9 Table S7 |
| 13c | State the evaluation of quality of evidence (e.g., using GRADE approach). | Table 1 |
| 13d | Describe the methods (e.g., piloted forms, independently, in duplicate) used for the quality assessment. | 9 Table S7 Table 1 |
| 14 | Specify any planned assessment of meta-bias(es) (such as publication bias or selective reporting across studies, ROBIS tool). | Table 1 |
| 15a | Specify clearly the method (narrative, meta-analysis, or network meta-analysis) of handling or synthesizing data and their details (e.g., state the principal summary measures that were extracted or calculated, how heterogeneity was assessed, what statistical approaches were used if a quantitative synthesis has been conducted) | 6-9 |
| 15b | Describe the software that was used to analyze the data if a quantitative synthesis has been conducted. | 9 |
| 15c | Report if zero events are included in the studies and how they were handled in statistical analyses, if relevant. | N/A |
| 15d | Describe methods of any prespecified additional analyses (such as sensitivity or subgroup analyses, meta-regression). | 6-9 |
|   |   |   |   |
|---|---|---|---|
| 16. Review and primary study selection | 16a | Provide the details of review selection (e.g., numbers of reviews screened, retrieved, and included and excluded in the overview) and the number of the additional eligible primary studies that were included, ideally with a flow diagram of the overview process. | 10-14 |
|   | 16b | Present a flow diagram that gives separately the number of studies focused on harms outcomes. | 10-14 |
|   | 16c<sup>c</sup> | List the studies (full citation) that were excluded after reading the full text and provide reasons. | Tables S8-S11 |
| 17. Review and primary study characteristics | 17a<sup>c</sup> | Describe characteristics of each included SR in tables (such as title or author, search date, PICOS, design and number of studies included, number and age range of participants, dose/frequency, follow up period [treatment duration], review limitations, results or conclusion) and of each additional primary study. | 10-14 Tables S8-S11 |
|   | 17b | For each included SR report language and publication status restrictions that have been used. | 10-12 Tables S3-S4 |
| 18. Overlapping | 18 | Present or/and discuss about overlapping of studies within SRs (at least one of the following):  
- Present measures of overlap (such as CCA).  
- Provide citation matrix.<sup>c</sup>  
- Give the number of index publications or/and discuss about overlapping.<sup>f</sup> | Tables S5-S6 |
| 19. Present assessment of methodological quality and quality of evidence | 19 | Present results in text or/and tables<sup>c</sup> of any quality assessment (see also subitems 13a-c):  
- Reporting or/and methodological quality of the included SRs.  
- Inform for the quality of the individual studies that were included in the SRs (report results for sequence generation, allocation concealment, blinding, withdrawals, bias etc.) and for the additional included primary studies.  
- Quality of evidence. | Tables S8-S11 |
| 20. Present meta-bias(es) | 20 | Present results of any assessment of meta-bias(es) (such as publication bias or selective reporting across studies, ROBIS assessment). | Table 1 |
| 21. Synthesis of results | 21a | Summarize and present the main findings of the overview for benefits and harms. If a quantitative synthesis has been conducted, present each summary measure with a confidence interval, prediction interval, or a credible interval and measures of heterogeneity or inconsistency. | 10-14 Tables S8-S11 Tables 2-3 |
|   | 21b | Give results of any additional analyses, if done (such as sensitivity, subgroup analyses, or meta-regression). | Tables 4 Table S12 |
|   | 21c | Report results for adverse events separately for each intervention. | N/A |

**Discussion**

|   |   |   |   |
|---|---|---|---|
| 22. Summary of evidence | 22 | Provide a concise summary of the main findings with the strengths and shortcomings of evidence for each main outcome. | 15-19 Tables 5-7 |
| 23. Limitations | 23a | Discuss limitations of either the overview or included studies (or both) (e.g., different eligibility criteria, limitations of searching reviews, language restrictions, publication and selection bias). | 18-19 |
|   | 23b | Report possible limitations of the included reviews related to harms (issues of missing data and information, definitions of harms, rare adverse effects). | 18-19 |
24. Conclusions

24a Provide a general interpretation of the results in coherence with the review findings and present implications for practice; consider the harms equally as carefully as the benefits and in the context of other evidence. 19

24b Present implications for future research. Tables 6-7

Authorship

25. Contributions of authors

25 Provide contributions of authors. 20

26. Dual (co-)authorship

26 Report about dual (co-)authorship in the limitation or declarations of interest section. N/A

Funding

27. Funding or other support

27a Indicate sources of financial and other support for the OoSRs (direct funding) or for the authors (indirect funding) or report no funding. 20

27b Provide name for the overview funder and/or sponsor, or for the authors’ supporters. 20

27c Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in conducted the OoSRs. 20

Source: Konstantinos I. et al 2017

Abbreviations: PRIO-harms: Preferred Reporting Items for OoSRs; SRs: systematic reviews; PICOS: Participants, Interventions, Comparisons, Outcomes, and Study design; CCA: Corrected Covered Area.
a Applicable mainly for OoSRs that focus on adverse events. The description could be placed in methods section.
b Language restrictions, publication status, and years could also be reported in information sources topic-see item 7.
c It could also be placed in an appendix as a supplementary material.
d The software used for the management of the records and data could be placed in the data collection process-see item 11.
e The way of evaluation (e.g., instruments) can be reported in item 19.
f Index publication is the first occurrence of a primary publication in the included reviews. Discussion for overlapping might be placed in the discussion section.
Table S3. Characteristics of the included systematic reviews.

| Systematics review | Literature search period | Literature search geographical coverage | Search terms | Data sources | MENA countries with identified data | Inclusion/exclusion criteria | Number of included studies on MENA | Targeted review population | Reported physical activity related outcomes |
|--------------------|--------------------------|----------------------------------------|--------------|--------------|------------------------------------|-----------------------------|----------------------------------|-----------------------------|----------------------------------------|
| Sisson, 2008<sup>3</sup> | 1996-2008 | Global | ‘national prevalence of physical activity’ and ‘Asia’, ‘Europe’, ‘Australia’, ‘United Kingdom’, ‘Africa’, ‘South America’, ‘America’, ‘North America’, ‘Great Britain’, ‘Mexico’, ‘Canada’ and ‘USA’ | PubMed BRFSS Related articles and references | Saudi Arabia, Pakistan, Tunisia, UAE | Included No more than 12 years since publication. In the case where successive years of data were available, the most recently available data were used. In countries where no representative population data were available, studies that, in the author’s best judgment, represent that country were included in the data abstraction process and were included in this compilation to provide some measure of PA for that country. Excluded If not presenting the data in ways that were comparable to other studies, The existence of more recent versions or cycles of the survey being available, or more representative data being available for the region. | 3 | Youth and adult general populations | PA Physical inactivity (if reported in the included study on physical activity) |
| Mabry, 2010<sup>4</sup> | N/S | GCC | ‘physical activity’ or ‘sedentary’ and the country name of each of the Member States of the Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates | PubMed WHO website Contacted WHO staff members in the field | Saudi Arabia, Kuwait, Bahrain, UAE, Qatar | Included English language, Reported the prevalence of sufficient PA in adults, Used population survey methods in an attempt to obtain a representative sample. Excluded Reported only on the prevalence of non-communicable disease or related risk factors, Were on issues not related to PA participation, Were review articles without primary data on PA. | 8 | Adult general population | PA Sedentary behavior (if reported in the included study on physical activity) |
| Ranasinghe, Inception | South-Asia | ‘Exercise’ and ‘Walking’, with keywords ‘Physical activity’, ‘Inactivity’, ‘Physical Activity Questionnaire’, ‘International Physical Activity Questionnaire’, ‘IPAQ’, ‘Global Physical Activity Questionnaire’ and ‘GPAQ’) AND (‘Sri Lanka’, ‘Lanka’, ‘Ceylon’, ‘India’, ‘Bangladesh’, ‘Pakistan’, ‘Nepal’, ‘Bhutan’, ‘Maldives’ | PubMed | Pakistan | Included | Population based studies among healthy non-institutionalized human adults (>15 years of age), Cross-sectional study design or being the first phase of a longitudinal study, Geographically and temporally defined population from any of the South Asian countries mentioned above, Being an original study presenting data on PA, Evaluating PA using questionnaires, Published in English, or with detailed summaries in English Peer-reviewed fully published research papers. Excluded Studies limited to adults engaged in a particular profession, based in hospitals/institutions and confined to those with diagnosed illnesses, Conference proceedings, editorials, commentaries and book chapters/book reviews. |
| South-Asian adult general population | Sedentary lifestyle or inactivity |
| Yammine, Inception | UAE | Boolean combination of broad terms such as [(‘physical activity’ OR sport) AND (children OR adolescent* OR student*)] AND UAE | EMBASE Medline SScieLO AMED AUSPORT SPORTDiscus Google_Scholar Dubai Ministry of Health Health Authority of Abu Dhabi | UAE, Morocco*, Djibouti*, Libya*, Jordan*, Egypt* | Included | Published and unpublished studies reporting PA level On adolescents or young subjects less than 25 years old, Have reported level of PA, The studied population is limited to the residents of UAE, Studies with prospective design. We included studies reporting validated and non-validated |
| Young adult and adolescent general population | PA levels (including physical inactivity levels) |
| **Mabry, 2016** | **Inception:** 2016 | **Oil-producing countries of the Arabian Peninsula** | **Active living; exercise; lifestyle; physical activity; walking; screen time; sedentary; sitting or television viewing; and the name of each country in the Region (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) or Arab** | **PubMed, Web of Science Knowledge, Google Scholar, Web Search Engine** | **Saudi Arabia, UAE, Oman, Qatar, Kuwait, Bahrain** | **Included** | The primary inclusion criteria were: Peer-reviewed publications in the English language, Country specific studies which gathered original data, fit into any phase of the Behavioral Epidemiology framework, Full-texts were available. Additional secondary inclusion criteria were used for the first three phases to facilitate within and cross-country comparison: Phase 1: Cross-sectional studies used a clearly described measure for PA/sedentary behavior and prospective studies involved a PA intervention Phase 3: Studies clearly defined PA as meeting the recommendation of 150 min/week for adults or 60 min/day for children/adolescents. Phase 4: For demographic correlates, studies used a clearly described measure for PA/sedentary. The secondary inclusion criteria were not used for the studies examining the non-demographic articles to ensure a comprehensive review of available research in the 27 | **Youth and adult general population** | **PA Sedentary behavior** |
| Study | Start Date | Region | Methods | Inclusion Criteria | Exclusion Criteria |
|-------|------------|--------|---------|--------------------|-------------------|
| Al-Hazzaa, 2018* | Up to Jan 15, 2018 | Saudi Arabia | PA, exercise, physical inactivity, PA barriers and PA determinants in combination with the words “Saudi Arabia,” “Saudi population,” and “Saudi people” | MEDLINE and Google Scholar | Articles in English literature, which included Saudi adults, adolescents or children without orthopedic problems and have a clear description of PA assessment methods and physical inactivity criteria. |
| Sharara, 2018* | January 2000 and January 2016 | 22 Arab countries | Various combinations of MeSH terms and keywords were used, related to physical activity/inactivity, sedentary lifestyle, exercise, sports, its prevalence, incidence, epidemiology, the burden it represents, and social or cultural factors | MEDLINE, Popline and Social Sciences, Citation Index, reference lists of the articles, WHO surveys on non-communicable disease risk factors (STEPS), Global School-based Student Health Surveys (GSHS) | Articles which fulfilled the quality criteria informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines including clear eligibility criteria for study selection, description of information sources, data and variables. |
| **Actual overview** | Inception 2016 | 20 MENA countries | Search terms used by the included SRs | PubMed | BRFSS | WHO website | Contacted WHO staff members in the field | Scopus | Web of Science Knowledge | The reference lists of articles | Possible forward citations | EMBASE | SSciELO | AMED | AUSPORT | SPORTDiscus | Google_Scholar | Dubai Ministry of Health | Health Authority of Abu Dhabi | Country reports of the WHO STEPS survey | Official reports not published in Saudi Arabia, UAE, Oman, Qatar, Kuwait, Bahrain, Pakistan, Tunisia, Morocco, Djibouti, Libya, Yemen, Sudan, Syria, Palestine, Algeria, Iraq, Lebanon, Jordan, Egypt | **Excluded** | Studies conducted exclusively on patients with a particular disease diagnosis, Studies conducted on Arabs residing outside the Arab region, Studies that did not report on sample size, age range of study population, and those that presented unclear or inconsistent numbers | 229 | Youth and adult general population | PA Physical inactivity, Sedentary behavior, Barriers to PA, Factors associated with physical inactivity |
| the academic literature | Hand search of the references of the Included studies | unpublished studies | Relevant web sites and online resources | Related articles and references |

PA: physical activity; UAE: United Arab Emirates; GCC: Gulf cooperation council; MENA: Middle-East and North Africa; SR: systematic review; USA: United States of America; BRFSS: Behavioral Risk Factor Surveillance System; WHO: World Health Organization; IPAQ: International physical activity questionnaire; GPAQ: Global physical activity questionnaire; min: minutes.

* Country data was extracted from the study of Guthold, 2010 \(^{10}\) included in the SR of Yammine, 2016 \(^{6}\). These country data were not reported in the SR of Yammine, 2016 \(^{6}\).
| Systematic review | Outcomes/population | Main conclusions | Identified limitations by the systematic review | Identified Strengths by the systematic review | Identified research gaps/the review recommendations | Recommendations |
|-------------------|---------------------|------------------|------------------------------------------------|------------------------------------------------|--------------------------------------------------|---------------|
| Sisson, 2008 ^3   | PA Physical inactivity (if reported in the included study on physical activity) Global youth and adult general populations | “In most studies of represented countries, less than 50% of the population was active.” | “Discrepancy in the methods of data collection and classification of ‘sufficient physical activity’ across studies.” | “The compilation of existing international data available on the prevalence of meeting public health PA recommendations in adults and youth will serve as a resource to epidemiologists and interventionists alike as it provides a benchmark for improvement and inter-country comparisons, as well as a basis for further examinations.” | “Need to discuss on the most appropriate and feasible methods to use in the measurement of PA in epidemiologic studies have not been recently instituted, as they have been ongoing for more than 20 years.” | Global need to increase PA. |
|                   |                     | “Males were more active than females in adult and youth populations.” | “The use of different surveys, all reporting time in PA, may not be comparable when it comes to reporting the prevalence of the sample meeting the minimum levels of PA.” | “Three multinational examinations of PA behavior that examine at least 23 countries each, which allows for some more direct comparisons across countries.” | “No health-based criteria for steps per day have been developed in adults or youth. It is not known that the accumulation of >13 0000 steps/day for boys is sufficient to result in health benefits.” |               |
|                   |                     | “Countries with the highest prevalence of PA in adults are: Switzerland, Sweden and Denmark and those with the lowest were Thailand, Saudi Arabia, Brazil and Iran.” | “The IPAQ overestimate the prevalence of PA compared with BRFSS.” | “Surveillance studies need to strive for an international standardization and recommendation-based metric to allow for greater comparisons between countries and regions to determine the prevalence of meeting recommendations that are based on improved health such as 30 min moderate PA on 5 days per week or 20 min of vigorous PA on 3 days per week.” | “Need for more PA data globally, there is a pressing need to understand changes in PA levels in several regions, in particular those countries undergoing economic and social transition.” |               |
|                   |                     | “The highest prevalence of physical inactivity was among Saudi Arabian women and the ones with the lowest prevalence were men from the United States.” | “Different studies used different age ranges, causing difficulties when comparing activity levels across studies among both youth and adults.” | “Greater collaboration among researchers in the standardization of surveillance methods to ensure that quality physical activity and inactivity surveillance is being conducted on a global level.” | “Designing studies that are comprehensive in the measurement of activity and sedentary behaviors” |               |
|                   |                     | “The prevalence of meeting PA recommendations was reported more frequently than prevalence of physical inactivity or ‘no leisure-time physical activity’. “ | “Difficulty and variability to capture transportation, occupation and active living behaviors such as chores and gardening (important for accumulating health-enhancing physical activity) from instrument to instrument.” | “Designing studies that are comprehensive in the measurement of activity and sedentary behaviors” | |               |
|                   |                     | “The prominent used surveys are BRFSS, IPAQ, and Active Australia.” | “The use of the same instrument across populations will not capture the variability in the type of activities between populations and could not cover all aspects of physical activities. As a consequence, differences in PA levels across populations may be masked.” | | |               |
| Mabry, 2010 | PA Sedentary behaviour (if reported in the included study on physical activity) GCC Adult general population | “Low prevalence of participation in levels of PA sufficient for health benefits among men and women in the GCC.” | “Due to the variations in methodological quality, it is difficult to compare prevalence rates and draw conclusions on the differences in prevalence of sufficient PA between countries of the GCC.” | “The results of three studies in this review utilized the GPAQ, which is a WHO instrument, and would have details on PA behaviour in three domains (occupation, transport and leisure), providing detailed evidence to inform related policy and program development.” | “Further research on the determinants of physical inactivity in the region is required, in order to have a better understanding of what might be done to increase PA participation.” | “Models of ‘best practice’ in the surveillance of PA should be identified and utilized in a collaborative fashion across countries.” | GPAQ should be incorporated into the surveillance system for obesity and related chronic disease risk factors in all six GCC countries. Health promotion strategies should aim to increase PA among both men and women as a priority public health issue. The use of a standard, valid and reliable measure for PA is crucial, not only for population surveillance but for program evaluation and inter-country comparison. Standardized study protocols to allow cross-country comparisons. |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PA needed for health benefits.”  
“The GCC studies measured total PA while the Australian and the USA studies report on non-occupational PA, thus making comparisons difficult.”  
“The studies in this review identified two primary correlates of PA – gender and age.”  
“Based on the two highest quality studies in this review, the proportion of physically active men was 13–14% points higher than women.”  
“The observed gender differences in PA participation are highly likely contributing to the higher prevalence of obesity in women compared with men in the GCC States.”  
‘Correlation with age is less clear.” | “The variation in the methodological quality of the studies:  
• Non-population-based sampling,  
• Use of unvalidated measurement instruments,  
• Varying PA definitions.  
• Only two of the reviewed studies provide any insight into sedentary behavior in the GCC States (women spend less time sitting than do men).”  
“These prevalence rates are based on total PA from three domains (occupational, transport and recreational), posing a challenge when comparing these rates with studies using the BRFSS tool in the USA and those using the Active Australia instrument, which measure non-occupational PA.”  
“Evidence using IPAQ or GPAQ in developed countries is scarce and any comparisons must be made with caution.”  
“Barriers for PA in GCC are:  
• Conservative social norms pose a particular barrier for women who have restricted freedom of movement outside the home,  
• The hot arid climate,  
• The high dependency on automobiles,  
• The employment of domestic helpers.” | “Identify the determinants of PA that may be responsive to shifts in the social contexts of the lives of men and women.”  
“Use of standardized research methodologies with nationally representative samples are urgently required in order to document properly levels of PA participation, gender and other social variations, and prevalence and trends over time.” | “Prevalence estimates tend to be higher using IPAQ compared with the BRFSS tool; and thus, direct comparison is not recommended.” |
| Ranasin ghe, 2013 | Sedentary lifestyle or inactivity | South Asian adult general population |
|------------------|----------------------------------|--------------------------------------|
| “A marked variation between studies in the definition of physical inactivity and in the questionnaires used.” | “Most of studies were limited to regional populations.” | “The comprehensive and easily replicable search strategy applied to three major medical databases.” |
| “Skilled workers and professionals were more inactive than unskilled workers in the region. Similarly, higher education was a significant factor.” | “As South Asian countries have considerably diverse ethnic groups, the regional findings may not be generalized to whole country or for the entire South Asian region.” | “Systematic selection of the studies through the application of well-defined inclusion/exclusion criteria. The GPAQ is known to be reliable for surveys in developing countries, adaptable to incorporate cultural differences.” |
| “Females were more inactive in the South Asian region when compared to males, a finding which is seen in most other regions and even in developed countries. Gender is an important factor to determining PA levels of a population.” | “No uniformity on PA assessment tools.” | “The GPAQ used in the WHO STEPSwise surveys and in the included studies give uniformity to the gathered data and allow meaningful comparisons.” |
| “Cultural expectations may restrict the participation of women in certain forms of PA in some religious and ethnic groups in the region. Several studies reported higher physical inactivity among South Asian women.” | “Several studies have used IPAQ, differences in the formats used limit comparability.” | “It is important for future researchers to adhere to a uniform way to evaluate PA in order to derive intraregional and inter-regional comparable data and observe secular trends in PA.” |
| “The traditional role of South Asian women in taking care of household work and supporting extended family members may limit the time available for them to engage in PA, in particularly leisure time physical activities.” | “A marked heterogeneity on the definition of physical inactivity/sedentary life style and physical activity levels and in the used tools. Hence, comparisons between studies were undertaken with caution.” | “It is important to consider individual country profiles, proportions of urbanity and cultures when delivering public health messages focused on leisure time activity.” |
| “Countries in the South Asian region in economic transition also need public health planning to enable the people to maintain their already existing active.” | “Only limited number of articles reported data on the sub-domains of physical activity (work, transport, and leisure).” | “Promoting leisure time activity has also become a challenge in South Asia due to cultural and attitudinal barriers.” |
| “Public health messages in the region should be directed at improving all domains of activity with work and transport policies of the countries supporting them.” | | |
"In the South Asian region, we observed that activity during work and transport is higher than leisure time activity."

"Low PA is one of the contributing risk factors for the higher obesity levels seen among Asian Indians."

"In all regional countries work and transport related activity was higher compared to leisure time activity."

"South Asian activity levels were in parallel or sometimes better than some developed countries."

**Yammine, 2016**

| PA levels | Young adult and adolescent general population |
|-----------|---------------------------------------------|
| **“Almost a quarter of the young population have a total sedentary lifestyle with no PA.”** | "Only five studies included." |
| **“Less than half have been mildly implicated in physical activities.”** | "The reported data were retrospective, recalled data, as it is the case where questionnaires are used for data collection." |
| **“Around a fifth practiced a moderate level of PA.”** | "Only two studies reported PA level as their primary outcome (non-significant impact as the data is on the same relevant population)." |
| **“A quarter were involved in a vigorous PA.”** | "The age variable was not always accurately reported but mostly limited to secondary school students." |
| **“The adolescent subgroup analyses revealed the same results except for the nil level of PA where one large study reported this level in almost half of its sample.”** | "Confounders such as body mass index, parents’ income/education, and ancestry were seldom included for" |

"A pooled sample of 12,988 young adults could be fairly considered as representative of UAE population."

"A predictable higher rate of coronary disease, diabetes, and other non-communicable chronic disease in the future."

"A meta-analysis could yield an answer as to whether the young adults and mainly the adolescents residing in UAE are getting enough PA to avoid disease in their lifetime."

"The findings could predict a higher rate of coronary disease, diabetes, and other non-communicable chronic disease in the future."

"Need to conduct large-sampled prospective studies in order to look for potential variables and barriers which would have an impact on the behavior of the young population vis-à-vis sports and physical activities as regular lifestyle habits."

"The findings could predict a higher rate of coronary disease, diabetes, and other non-communicable chronic disease in the future."

"Need to stimulate more political commitment to promote PA among school and university students."

"Decision makers such as the ministry of health, school and..."
“Mild PA was more common in female adolescents, whereas moderate and high PA were significantly higher in male adolescents.”

“Young adults, mainly adolescents, residing in UAE are not getting enough PA to keep themselves healthy.”

“Adolescents in UAE were more involved in moderate PA and in vigorous PA than adults in the DHA.”

“Male adolescents were more involved into moderate/vigorous PA than female adolescents.”

“The negative relationship between PA and age observed in the DHA is also true at the adolescent/young adult phase and that there is a gender shift where young adult males become less interested in PA than male adolescents, while female adults showed a trend to practice more PA when compared to female adolescents.”

“Higher level of PA among UAE nationals indicates a behavioral shift among UAE national adolescents when becoming young adults.”

analysis in most of the included studies.”

“High degree of heterogeneity between studies. Absence of accurate definition of PA levels among and between studies.”

“Two out the five studies reported the use of personal questionnaire elaborated by the authors, whereas the remaining three studies used validated questionnaires.”

university board committees, parent’s committees, and local communities could work on establishing national policies in order to dedicate more ‘sport’ hours in a student week and to develop a wider panel of PA activities in their neighborhoods which might encourage greater involvement among students.”
**Mabry, 2016**

| PA  | Sedentary behaviour |
|-----|---------------------|
| Oil-producing countries of the Arabian Peninsula youth and adult general population |

“A 100 publications were identified since 2000, over half of these were published since 2013.”

“Overall low levels of participation in PA (particularly among young people), and high levels of sedentary behaviour (particularly among men and young people).”

“Although the prevalence of PA among adolescent was generally higher than in adults, a large percentage of both adults and adolescents did not engage in sufficient amounts.”

“Gender and age were consistently association with PA.”

“Men were found to be more active than women and younger people more active than older people which is consistent with other countries.”

“Four studies in this review reported an inverse association of PA with education which was inconsistent with other countries. This correlate likely being more context and/or culture-specific.”

“Most studies depended on self-report instruments with only a limited number

“The body of evidence included only a small number of prospective and cross-sectional studies which reported generally consistent associations between PA and sedentary behaviors and various health outcomes.”

“Many of the studies to date have employed a narrow understanding of PA behavior, with their focus on “exercise” where this is a formal and structured activity.”

“A wide variability and quality in the measurement instruments used and the presentation of outcomes variables of exposure which severely limits within-and between-country comparisons.”

“Limited adoption of other valid and reliable tools, other than GPAQ and IPAQ, to assess PA and sedentary behaviors, measures of the physical environment, self-reported cognitive, psychosocial measures and domain-specific measures.”

“Fewer published studies addressed the measurement of PA and sedentary behaviors.”

“Studies were mostly focused on adults rather than children.”

“The sedentary behavior research identified in this review was much more limited than that related to PA.”

“Our review was restricted to published studies in the English

“The Arabic version of the Questionnaire l’ Activite Physique en Altitude Chez les Enfants for children under the age of 10 years and the ATLS, the Arabic Version of the Physical Activity Self-Efficacy Scale for Adolescents were identified as valid PA instruments for young people in the Arab world.”

“Publications were found from all six countries in the study area.”

“The findings point towards the need for more and higher quality research.”

“Examining the associations between patterns of PA and sedentary behaviors with various health outcomes in Arab populations should continue to address the knowledge gaps but future studies should employ rigorous methodologies including prospective study design and use objective measures of exposure to increase the quality of evidence available from this region.”

“Further studies using standardized methods of nationally representative samples are needed to monitor trends as well as to identify population variations and vulnerable groups. This point is particularly important since countries are expected to report on PA levels for both adult and adolescent populations as part of the WHO Global Plan of Action.”

“Research on domain-specific PA for different populations groups is urgently needed to guide the development of targeted regionally appropriate interventions in light of regional trends like motorization and shifts in occupational patterns.”

“Evidence on potential multiple levels of influence on PA (intrapersonal, perceived, social cultural, information, natural and policy environments) for countries in this region is needed to understand the particular influences that may operate in Arab populations and their social and environmental contexts so as to inform policy and practice.”

“Given the importance of increasing PA and reducing sedentary behaviors as part of a comprehensive population-based approach to the prevention of non-communicable
employing objective instruments to assess either behaviors.”

“The study of sedentary behaviour, relatively new globally, is only now beginning to receive the attention of researchers in the countries of the Arabian Peninsula.”

language. It is likely that additional studies such as government reports and scientific papers published in Arabic journals do exist but were not included.”

“The search was limited to only three multidisciplinary literature databases it is possible that additional databases may have identified more studies.”

“The variation in tools and methodologies as well as methodological quality limited within and cross-country comparability.”

“These limitations may bias our view of the gaps in evidence and potential solutions.”

“Accurate measurement is critical for policy development and necessary for population monitoring of trends over time and differences between populations. It is also essential for research aimed at program evaluation of individual-based and population-based actions.”

“The proposed research agenda would be similar to that outlined globally; an ecological model of four domains of sedentary behavior focusing specifically on domestic screen time, extended sitting time in workplaces and schools, and time spent sitting in cars – not only to better understand their determinants but also in designing appropriate interventions.”

“More-basic descriptive data in the region should be a higher priority.”

Al-Hazzaa., 2018

Physical Inactivity, Perceived barriers and correlates of PA
Saudi children, youth and adults

“The current review confirmed the presence of high inactivity prevalence among the majority of Saudi children, youth and adult population”

“Saudi females are much more inactive than males, beginning from early school years”

“The findings from national or subnational studies indicated that the mean physical inactivity prevalence ranged from 50% to 85% among males and from 73% to 91% among females”

“Some of the reviewed studies are lacking in one or more of the following limiting factors: The sample was not accurately represented, especially for some of the local studies, not reporting response rate, using less validated PA questionnaires and lack of statistical power calculation of the sample size”

“Unfortunately, many of the studies reporting PA prevalence among Saudi population used questionnaires that were not validated”

“The real overall prevalence of physical inactivity among Saudi females in studies using IPAQ may be much higher than what

“This systematic review is considered as the first comprehensive and updated overview on PA in Saudi Arabia, covering inactivity prevalence, reasons for exercise, correlates, and barriers to PA”

“Although time constraint, lack of facilities and resources, low self-efficacy, and lack of social support (especially in the part of women) represent a major barriers to being physically active among Saudis, there remains a need to further understand the personal, social and environmental barriers to PA in Saudi population, particularly in relation to different domain of PA (leisure time, occupational, transports, and households PA)”

“Possible barriers to PA must be determined and eliminated to promote active living and reduce inactivity among the population”

“Saudis need to be more physically active than the current estimates, to control the escalating prevalence of NCDs in this country, such as obesity, diabetes mellitus, cardiovascular diseases, and cancer”

“Saudis need to create ways to make PA opportunities more available in
“The proportions of Saudis who are at risk of inactivity are exceedingly higher than those at risk for other coronary heart diseases”

“The majority of Saudi children and youth were not active enough to meet the minimal weekly requirements of MVPA levels”

“Sedentary behaviors appear to be highly prevalent among Saudi adolescents, as 84% of males and 91.2% of females spent more than 2 h of screen time daily”

“Active Saudi boys tend to have favorable levels of blood lipids and body composition profile compared to inactive boys”

“Reduced PA was associated with obesity and WC in adults, children, and adolescents”

“Physical inactivity increased with advancing age in children and adolescents as well as in adults”

“Increased urbanization, crowded traffic, extreme weather, cultural barriers, lack of social support, the absence of female school PA program and lack of time and resources, all have been previously reported. This may be due to the fact that, previous studies have shown that there was the possibility of over-reporting moderate levels of PA when using IPAQ”

“PA prevalence for a population from different studies using varied PA instruments must be viewed with caution”

“The vast majority of the PA activity studies were conducted in urbanized areas of the country, apart from the few national studies and very limited studies included samples from rural areas”

“Reduced PA was associated with obesity and WC in adults, children, and adolescents”

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“PA prevalence for a population from different studies using varied PA instruments must be viewed with caution”

“The vast majority of the PA activity studies were conducted in urbanized areas of the country, apart from the few national studies and very limited studies included samples from rural areas”

“A national policy encouraging active living and discouraging inactivity be established”

“Health-care providers have an important role in promoting PA, by providing routine assessment and counseling on increasing PA, improving fitness and reducing sedentary behaviors for their patients and communities. They can adopt a comprehensive curriculum that potentially closes the gap in medical schools, residency programs, graduate education, and nursing curricula on topics related to PA, and exercise prescription and lifestyle health”

schools, workplaces, and within the community settings”

“A national policy encouraging active living and discouraging inactivity be established”

“Health-care providers have an important role in promoting PA, by providing routine assessment and counseling on increasing PA, improving fitness and reducing sedentary behaviors for their patients and communities. They can adopt a comprehensive curriculum that potentially closes the gap in medical schools, residency programs, graduate education, and nursing curricula on topics related to PA, and exercise prescription and lifestyle health”
make PA a difficult choice for the Saudis’

“Saudi women have less access to exercising facilities and limited opportunities to engage in PA”

“A large percentage of schoolgirls lacked proper information and skills on how to exercise or to be physically active”

“The most important reasons for engaging in PA among adolescents and adults are health, losing or maintaining weight, recreation, and socializing”

“Variables that are found to positively associate with adult’s PA include high education level, high income, enjoyment of PA, self-efficacy, social support, and safe environment”

“The factors that are believed to be negatively associated with adult PA include advancing age, low income, lack of time, low motivation, obesity, and poor health”

“Gender (boys), self-efficacy, parental support, parental education, physical education, or sports at school and
| Sharara et al., 2018 | **Physical inactivity and its social determinants in Arab countries**
| Adults and children/adolescents | “Prevalence of inactivity among adults and children/adolescents is high across countries, and is higher among women”
| | “Among children and adolescents, inactivity is alarmingly high, around 80% in all national surveys except Tunisia”
| | “Inactivity increased with age, being married, and urban residence; it decreased with increased education and employment; parity was positively associated with inactivity in one study”
| | “Screen time, smoking and alcohol were positively associated with physical inactivity”
| | “Consuming fruits and vegetables were negatively correlated with physical inactivity”
| | “The diversity of definitions and methods among studies published in journals and the fact that only 43/157 studies used validated instruments hampers comparisons of the prevalence and correlates of physical activity, and it is possible that some of the differences we found are artifactual”
| | “Only 16/143 journal articles reported on surveys using nationally representative samples”
| | “Age categories in journal articles are more diverse”
| | “Standardized data available from surveys by the World Health Organization for almost all countries and journal articles show great variability in definitions, measurements and methodology”
| | “For some countries there are very few studies (Algeria, Comoros, Djibouti, Iraq, Somalia, Sudan and Yemen), while for others many more sources are available (for example 40 for Saudi Arabia)”
| | This is a comprehensive assessment of the prevalence and determinants of physical inactivity across the Arab region
| | “Studies using harmonized approaches, rigorous analytic techniques and a deeper examination of context are needed to design appropriate interventions”
| | “The high levels of inactivity in the region call for considerable efforts to tackle the material and socio-cultural aspects of the cultural context that discourage physical activity”
| | “Multi-sectoral efforts are needed, including collaborations among ministries of health, sports, youth and education, as well as wider collaborations that involve sectors such as transport, environment and urban planning”
“There is also a variability in sample size, with most studies in the range of 200-2000 and a few large studies including several thousand respondents.”

Note: the evidence retrieved from each SR is related to the included countries target by the SR. Could not be totally applicable to the included MENA countries.

Abbreviations: PA: Physical activity; IPAQ: International physical activity questionnaire; GPAQ: Global physical activity questionnaire; ATLS: Arab teens lifestyle student questionnaire; PACE+: Adolescent physical activity measure questionnaire; DHA: Household Health Survey; SBRN: Sedentary Behavior Research Network MENA: Middle-East and North Africa; UAE: United Arab Emirates; GCC: Gulf cooperation council; SR: Systematic review; BRFSS: Behavioral Risk Factor Surveillance System; WHO: World Health Organization; Min: Minutes; VPA: Vigorous physical activity; MPA: Moderate physical activity; NCDs: Non-communicable diseases; CS: Cross-sectional; RS: Random sampling; RCS: Random cluster sampling; MET: Metabolic Equivalent of Task; VG: Video games; km: Kilometer; min: Minutes; wk: Week; d: day
**Table S5:** Converted data from physical inactivity to physical activity.

| Review source, study source, country | Physical inactivity definition, population | Physical inactivity prevalence | Inclusion or exclusion/reason | Converted physical activity prevalence |
|-------------------------------------|-------------------------------------------|--------------------------------|-------------------------------|---------------------------------------|
| Sisson, 2008; Sharara, 2018; Al-Hazzaa 2018; Al-Nozha, 2007; Saudi-Arabia | Inactive: <600 METmin/wk Adults | Males: 94% Females: 98% | Included: PA data not overlapping with previously included data | Males: 6% Females: 2% |
| Yammine, 2016; Amine, 1996; UAE | Nil practice of PA – (Never participated in physical exercises**) Adults | Females: 48.5% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Yammine, 2016; Mehairi, 2013; UAE | Mild level of PA – (low score of PA**) | Males: 24.1% Females: 45.1% | Excluded: PA data on the same population already included | No |
| Yammine, 2016; Muhairi, 2013; UAE | Mild level of PA – (low score of PA**) | Males and females: 36.5% | Excluded: PA data on the same population already included | No |
| Yammine, 2016; Amine, 1996; UAE | Mild level of PA – (Mild participation in physical exercises**) Adults | Females: 47.1% | Excluded: PA data on the same population already included | No |
| Yammine, 2016; Wasfi, 2008; UAE | Nil practice of PA – (did not practice: PA at all**) Adults | Males: 10.7% Females: 35.0% | Excluded: PA data on the same population already included | No |
| Yammine, 2016; Wasfi, 2008; UAE | Mild level of PA – (No vigorous activity or irregularly practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**) | Males: 51.6% Females: 45.2% | Excluded: PA data on the same population already included | No |
| Yammine, 2016; Wasfi, 2008; UAE | Nil practice of PA – (did not practice PA at all**) among Emiratis youth | Males and females: 18.9% | Excluded: PA data on the same population already included | No |
| Ranasinghe, 2013; Khuwaja, 2010; Pakistan | Inactivity: (< 30 minutes of moderate to vigorous activity most of the days [at least 4] in last 7 days**) Adults | Males: 52.1% Females: 69.8% | Included: PA data not overlapping with previously included data | Males: 47.9% Females: 30.2% |
| Sisson, 2008; Guthold, 2008; Pakistan | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session Adults | Males: 12.8% Females: 27.3%† | Included: PA data not overlapping with previously included data | Males: 87.2% Females: 72.7%‡ |
| Sisson, 2008; Sharara, 2018; Guthold, 2008; Tunisia | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session Adults | Males: 11.0% Females: 18.2%† | Included: PA data not overlapping with previously included data | Males: 89.0% Females: 81.8%‡ |
| Sisson, 2008; Sharara, 2018; Guthold, 2008; UAE | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session Adults | Males: 37.9% Females: 56.7%† | Included: PA data not overlapping with previously included data | Males: 62.1% Females: 43.2%‡ |
| Sharara, 2018; Al-Baghi, 2008; Saudi Arabia | No PA or mild PA (ordinary housework, walking) | Males and Females: 79.20% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Sharara, 2018; Memish, 2014; Saudi Arabia | Neither moderate nor vigorous PA | Males and Females: 69.10% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Sharara, 2018; Al-Murshed, 2009; Saudi Arabia | No exercise | Males and Females: 52% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Sharara, 2018; Al-Hazzaa, 2018; Al-Quaiz, 2009; Saudi Arabia | Not practicing in any regular sport and leisure time PA | Males and Females: 82.40% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Sharara, 2018; Al-Senany, 2015; Saudi Arabia | Less than one-hour weekly activity | Males and Females: 69% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Sharara, 2018; Amin, 2014; Saudi Arabia | <30 minutes /≥ 5 days/week | Males and Females: 80.0% | Included: PA data not overlapping with previously included data | Males and Females: 20.0% |
| Country                | Study/Year          | Definition                                                                 | Gender Data                                                                 | Inclusion Details                                                                 |
|-----------------------|---------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Saudi Arabia          | Sharara, 2018;      | <600 MET-minutes/week                                                       | Males and Females: 67%                                                         | Included: PA data not overlapping with previously included data                    |
|                       | Garawi, 2015        |                                                                            |                                                                                | Males: 61.0% Females: 73.7%                                                      | Excluded: PA data from the same study already included                             |
| Tunisia               | Sharara, 2018;      | <150 min/week of moderate level of PA                                      | Males and Females: 44.4%                                                       | Included: PA data not overlapping with previously included data                    |
|                       | Maatoug, 2013       |                                                                            |                                                                                | Males: 40.0% Females: 55.6%                                                      | Males: 60.0% Females: 55.6%                                                      |
| UAE                   | Sharara, 2018;      | Inactivity: < 3 days of VPA at 20 min/session or < 5 days MPA at 30 min/session | Males: 50.9%                                                                  | Included: PA data not overlapping with previously included data                    |
|                       | Guthold, 2008       |                                                                            |                                                                                | Females: 41.0%                                                                   |                                                                                    |
|                       | Sharara, 2018;      | Less than one hour, <3 times per week                                       | Males and Females: 39.4%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Abdulle, 2006       |                                                                            |                                                                                | No                                                                                |
|                       | McIlvenny, 2000     | No regular exercise                                                        | Males and Females: 54.0%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Sharara, 2018;      | < 1 hour/week of sport                                                     | Males and Females: 47.5%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Sabri, 2004         |                                                                            |                                                                                | No                                                                                |
|                       | Sharara, 2018;      | No deliberate non-work-related exercise outside the home such as walking, running or cycling | Males and Females: 68.4%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Ahmed, 2013         |                                                                            |                                                                                | No                                                                                |
| Kuwait                | Sharara, 2018;      | (Neither moderately nor very Active) Lightly active**                       | Males and Females: 57.9%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Al-Zenki, 2012      |                                                                            |                                                                                | No                                                                                |
| Kuwait                | Sharara, 2018;      | (Neither moderate nor vigorous PA) Moderate PA was considered if participants engaged in physical efforts that cause light sweating or a slight increase in breathing or heart rate; examples of moderate PA included, brisk walking, painting houses, gardening and climbing stairs** | Males and Females: 63%                                                         | Included: PA data not overlapping with previously included data                    |
|                       | Alarouj, 2013       |                                                                            |                                                                                | Males: 37.0% Females: 37%                                                      | Males: 37.4% Females: 37%                                                        |
| Kuwait                | Sharara, 2018;      | Not engaging in regular PA                                                  | Males and Females: 45%                                                         | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Naser Al-Isa, 2011  |                                                                            |                                                                                | No                                                                                |
| Kuwait                | Sharara, 2018;      | <600 MET-minutes/week                                                       | Males: 51.4% Females: 72.8%                                                    | Included: PA data not overlapping with previously included data                    |
|                       | WHO-STEPS survey, 2014 |                                                                            |                                                                                | Males: 37.4% Females: 27.2%                                                    |                                                                                    |
| Kuwait                | Sharara, 2018;      | <840 MET-min/week                                                          | Males and Females: 50. 8%                                                      | Included: PA data not overlapping with previously included data                    |
|                       | Al-Nakeeb, 2015     |                                                                            |                                                                                | Males: 49.2% Females: 49.2%                                                    |                                                                                    |
| Qatar                 | Sharara, 2018;      | <600 MET-minutes/week                                                       | Males: 37.4% Females: 54.2%                                                    | Included: PA data not overlapping with previously included data                    |
|                       | WHO-STEPS survey, 2012 |                                                                            |                                                                                | Males: 62.6% Females: 45.8%                                                    |                                                                                    |
|                       | Sharara, 2018;      | Not engaging in moderate activity (resulting in light sweating, small increases in breathing or heart rate) | Males and Females: 51.8%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Zindah, 2008        |                                                                            |                                                                                | No                                                                                |
| Jordan                | Sharara, 2018;      | Less than having moderate: activity that caused light sweating and small increases in heart rate or breathing for 30 minutes | Males and Females: 47.4%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Centers for Disease |                                                                            |                                                                                | No                                                                                |
|                       | Control, Prevention, |                                                                            |                                                                                | No                                                                                |
|                       | 2003                |                                                                            |                                                                                | No                                                                                |
|                       | Sharara, 2018;      | No exercise                                                                | Males and Females: 22.5%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Kulwiciki, 2001     |                                                                            |                                                                                | No                                                                                |
| Jordan                | Sharara, 2018;      | <30 min of PA 3 or more days/week**                                        | Males and Females: 81.5%                                                       | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
|                       | Madanat, 2006       |                                                                            |                                                                                | No                                                                                |
| Jordan                | Sharara, 2018;      | <600 MET-minutes/week                                                       | Males: 5.8% Females: 4.5%                                                     | Included: PA data not overlapping with previously included data                   |
|                       | WHO-STEPS survey, 2007 |                                                                            |                                                                                | Males: 94.2% Females: 95.5%                                                    |                                                                                    |
| Study                                      | Physical Activity                              | Participants                      | Exclusions                                                                 | NOTEs |
|--------------------------------------------|------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------|--------|
| Sharara, 2018; Mohannad, 2008<sup>42</sup> Jordan | No activity that caused light sweating and small increases in heart rate or breathing | Males and Females: 58.7%         | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; WHO-STEPs survey, 2011-12<sup>43</sup> Egypt | <600 MET-minutes/week                           | Males: 23.3% Females: 42%         | Excluded: Total sample size not provided                                   | No     |
| Sharara, 2018; Abolfotouh, 2007<sup>41</sup> Egypt | (No non-vigorous PA for at least 20 minutes or 3 times per week) | Males and Females: 33.8%          | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; Kamel, 2013<sup>44</sup> Egypt | Not active                                      | Males and Females: 33.80%         | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; Mahfouz, 2014<sup>46</sup> Egypt | No exercise                                     | Males and Females: 63.80%         | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; Mahfouz, 2014<sup>46</sup> Egypt | No exercise                                     | Males and Females: 100%           | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; WHO-STEPs survey, 2015<sup>45</sup> Iraq | <600 MET-minutes/week                           | Males: 34.9% Females: 60%         | Included: PA data not overlapping with previously included data            | Males: 65.1% Females: 40% |
| Sharara, 2018; WHO-STEPs survey, 2009<sup>48</sup> Libya | <600 MET-minutes/week                           | Males: 36% Females: 51.7%         | Included: PA data not overlapping with previously included data            | Males: 64% Females: 48.3% |
| Sharara, 2018; WHO-STEPs survey, 2009<sup>48</sup> Lebanon | <600 MET-minutes/week                           | Males: 52.2% Females: 40.3%       | Included: PA data not overlapping with previously included data            | Males: 47.8% Females: 59.7% |
| Sharara, 2018; Al-Al-Tannir, 2008<sup>49</sup> Lebanon | Less than 3 days/week                           | Males and Females: 42.7%          | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; Musharrafieh, 2008<sup>51</sup> Lebanon | Physical exercise for <0.5 h/week               | Males and Females: 73.6%          | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; Tamim, 2003<sup>52</sup> Lebanon | <3 hours/week                                   | Males and Females: 64.3%          | Included: PA data not overlapping with previously included data            | Males and Females: 35.7% |
| Sharara, 2018; Farah, 2015<sup>53</sup> Lebanon | Neither moderate intensity PA for at least 150 min per week or vigorous intensity PA for 75 min at least per week | Male and Female 76%               | Included: PA data not overlapping with previously included data            | Male and Female 24% |
| Sharara, 2018; Tohme, 2005<sup>54</sup> Lebanon | Never engaging in any PA                        | Male: 40.3%                      | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; WHO-STEPs survey, 2010-11<sup>55</sup> Palestine | <600 MET-minutes/week                           | Male and Female 46.5%             | Included: PA data not overlapping with previously included data            | Male and Female 53.5% |
| Sharara, 2018; WHO-STEPs survey, 2010-11<sup>55</sup> Palestine | <600 MET-minutes/week                           | Males: 33.8% Females: 59.2%       | Excluded: Total sample size not provided                                   | No     |
| Sharara, 2018; Abdul-Rahim, 2003<sup>56</sup> Palestine | Occupation-related sedentarylight PA for men AND no exercise for women | Males and Females: 56.2%          | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; Abu-Mourad, 2008<sup>57</sup> Palestine | No home exercise or sports                     | Males and Females: 78%            | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Sharara, 2018; WHO-STEPs survey, 2003<sup>58</sup> Algeria | <600 MET-minutes/week                           | Males: 32.5% Females: 45.8%       | Included: PA data not overlapping with previously included data            | Males: 67.5% Females: 54.2% |
| Sharara, 2018; WHO-STEPs survey, 2005-2006<sup>59</sup> Sudan | <600 MET-minutes/week                           | Males: 75.9% Females: 94.8%       | Included: PA data not overlapping with previously included data            | Males: 24.1% Females: 5.2% |
| Sharara, 2018; El Rhazi, 2011<sup>60</sup> Morocco | Less than 30 min of regular, moderate or intense PA on most days** | Males: 32.4% Females: 45.4%       | Included: PA data not overlapping with previously included data            | Males: 67.6% Females: 54.6% |
| Sharara, 2018; Najdi, 2011<sup>61</sup> Morocco | <600 METmin/wk,**                              | Males and Females: 16.5%          | Included: PA data not overlapping with previously included data            | Males and Females: 83.5% |
| Sharara, 2018; Hamadeh, 2000<sup>62</sup> Bahrain | No exercise                                    | Males and Females: 89.1%          | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Year | Authors | Country | Definition | Sample Size | Gender | Exclusion Reason | Included: PA data not overlapping previously included data | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | Females: | Males: |
|------|---------|---------|------------|-------------|--------|-----------------|-------------------------------------------------|-------------------------------------------------|--------|--------|
| 2018  | Al Hazzaa, A. | Saudi Arabia | < 600 METs-min/week | Females: 56.1% Males: 56.8% | | | Included: PA data not overlapping with previously included data | | Males: 43.8% | Females: 43% |
| 2018  | Maby, C. | Saudi Arabia | < 1 time per week | Females: 72.5% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males: 76.5% | |
| 2018  | Al Hazzaa, A. | Saudi Arabia | < 600 METs-min/week | Females: 44% | | Included: PA data not overlapping with previously included data | | Females: 56% | |
| 2018  | Maby, C.; Al Hazzaa, A.; Alzahrani, A. | Saudi Arabia | < 150 min/week moderate activity or < 60 min/week vigorous activity | Males: 63.8% Females: 65% | | Included: PA data not overlapping with previously included data | | Males: 31.2% Females: 35% | |
| 2018  | Al Hazzaa, A. | Saudi Arabia | No regular activity | Males: 76.5% | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males: 76% | |
| 2018  | Al Hazzaa, A.; Al-Shahrani, A. | Saudi Arabia | No PA | Males: 41% Females: 45% | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males: 21.3% Females: 21% | |
| 2018  | Al Hazzaa, A.; Al Ateeq, M. | Saudi Arabia | Active category: 30 min or more a day of moderate PA, 5 or more days a week. OR 20 min or more a day of vigorous PA, 3 or more days a week | Males: 78.7% Females: 79% | | Included: PA data not overlapping with previously included data | | Males: 21% Females: 21% | |
| 2018  | Al Hazzaa, A.; Taha, T. | Saudi Arabia | < 3 times/week for 20 min | Males: 43.3% Females: 84.7% | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males: 54% Females: 53% | |
| 2018  | Al Hazzaa, A.; Abozaid, A.; Al-Rafee, A. | Saudi Arabia | < 150 min/week moderate activity or < 60 min/week vigorous activity | Males: 46% Females: 47% | | Included: PA data not overlapping with previously included data | | Males: 49.5% Females: 52.5% | |
| 2018  | Al Hazzaa, A.; Sharara, A.; Amin, A. | Saudi Arabia | < 600 METs-min/week | Males: 50.5% Females: 44.8% | | Included: PA data not overlapping with previously included data | | Males: 49.5% Females: 52.5% | |
| 2018  | Al Hazzaa, A.; Khalid, K. | Saudi Arabia | No strenuous exercise for >= 3 times per week | Males: 59.4% Females: 99.5% | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males: 69.2% | |
| 2018  | Al Hazzaa, A.; Bin Horaih, S. | Saudi Arabia | < 30 min per day/5 days** | Males: 30.8% | | Included: PA data not overlapping with previously included data | | Males: 69.2% | |
| 2018  | Al Hazzaa, A.; Al-Rafee, A.; Al-Rafee, A. | Saudi Arabia | No regular activity | Males: 80.9% | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males: 56.3% Females: 65.7% | |
| 2018  | Al Hazzaa, A.; Al-Hazzaa, A. | Saudi Arabia | < 600 METs-min/week | Males: 43.7% Females: 34.3% | | Included: PA data not overlapping with previously included data | | Males: 56.3% Females: 65.7% | |
| 2018  | Al Hazzaa, A.; Al-Hazzaa, A. | Saudi Arabia | < 600 METs-min/week | Males: 73% | | Included: PA data not overlapping with previously included data | | Males and Females: 73% | |
| 2018  | Al Hazzaa, A.; Al-Zalabani, A. | Saudi Arabia | < 600 METs-min/week of moderate, or < 60 min / week vigorous activity | Males: 60.1% Females: 72.9% | | Included: PA data not overlapping with previously included data | | Males: 39.9% Females: 27.1% | |
| 2018  | Al Hazzaa, A.; El Bcheraoui, N. | Saudi Arabia | < 150 MET-min / week | Males and Females: 66.39% | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | | Males and Females: 66.39% | |
| Year | Region | Sample Characteristic | Gender Males | Gender Females | Definition | Exclusions | Inclusions |
|------|--------|-----------------------|--------------|---------------|------------|------------|------------|
| 2018 | Saudi Arabia | <600 MET-s min per week | 52.1% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Saudi Arabia | MVPA | 36.9% | | | Included: PA data not overlapping with previously included data | |
| 2017 | Saudi Arabia | <30 min/day, 5 days/week | 86.7% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Saudi Arabia | Complete absence of exercise | 45.20% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Not engaging in sports | 27.30% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | No regular exercise | 31.90% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Based on weekly frequency: Never | 15.7% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Less than 30 min of physical exercise during the previous week | 34.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Gulf Cooperation Council States | <60 min per day on five or more days during the past seven days | 72.5% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Oman | <60 min per day on all seven days during the past seven days | 88.3% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Oman | <60 min per day on all seven days during the past seven days | 84.6% | | | Excluded: Total sample size not provided. Could not be included in the MA | No |
| 2018 | Oman | Engaging in physical activities <once per week, apart from school physical education | 66.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Kuwait | <5 days/week of playing sport | 72.1% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Kuwait | <60 min per day on all seven days during the past seven days | 82.9% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Kuwait | <60 min per day on all seven days during the past seven days | 81% | | | Excluded: Total sample size not provided. Could not be included in the MA | No |
| 2018 | Kuwait | Only performing normal daily routine with some recreational activities or walking slowly and doing no structured exercise | 71.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Libya | 31.90% | | | | Included: Prioritized on the data from Guthold, 2010 as it includes higher sample size | |
| 2018 | Djibouti | <60 min per day on all seven days during the past seven days | 81.2% | | | Included: Prioritized on the data from Guthold, 2010 as it includes higher sample size | |
| 2018 | Morocco | <60 min per day on all seven days during the past seven days | 81.8% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Jordan | Not very physically nor moderately active | 4% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Morocco | <60 min per day on five or more days during the past seven days | 82.6% | | | Included: Prioritized on the data from Guthold, 2010 as it includes higher sample size | |
| 2018 | Morocco | <60 min per day on five or more days during the past seven days | 79.2% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Morocco | <60 min per day on five or more days during the past seven days | 79.2% | | | Included: PA data not overlapping with previously included data | |

**YOUTH**

| Year | Region | Sample Characteristic | Gender Males | Gender Females | Definition | Exclusions | Inclusions |
|------|--------|-----------------------|--------------|---------------|------------|------------|------------|
| 2018 | Saudi Arabia | Complete absence of exercise | 45.20% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Not engaging in sports | 27.30% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | No regular exercise | 31.90% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Based on weekly frequency: Never | 15.7% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Less than 30 min of physical exercise during the previous week | 34.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Saudi Arabia | Engaging in physical activities <once per week, apart from school physical education | 66.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Oman | <5 days/week of playing sport | 72.1% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Oman | <60 min per day on all seven days during the past seven days | 82.9% | | | Included: PA data not overlapping with previously included data | |
| 2018 | Oman | <60 min per day on all seven days during the past seven days | 84.6% | | | Excluded: Total sample size not provided. Could not be included in the MA | No |
| 2018 | Oman | Engaging in physical activities <once per week, apart from school physical education | 66.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| 2018 | Kuwait | <60 min per day on all seven days during the past seven days | 81% | | | Excluded: Total sample size not provided. Could not be included in the MA | No |
| 2018 | Kuwait | Only performing normal daily routine with some recreational activities or walking slowly and doing no structured exercise | 71.3% | | | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No |
| Country            | Prevalence | Exclusions                                                                                                                                                                                                 |
|--------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Morocco            | 86.7%      | Included: PA data not overlapping with previously included                                                                                                                                                |
| Yammine, 2016<sup>6</sup>; Sharara, 2018<sup>8</sup>; GSHS, 2006<sup>10</sup> Egypt | < 60 min per day on all seven days during the past seven days Males and Females: 90.6% | Included: PA data not overlapping with previously included Males and Females: 9.4% |
| Yammine, 2016<sup>6</sup>; Sharara, 2018<sup>8</sup>; GSHS, 2006<sup>10</sup> Egypt | < 60 min per day on all seven days during the past seven days Males: 85.5% Females: 96.6% | Excluded: Data overlapping with Guthold, 2010<sup>10</sup> No |
| Sharara, 2018<sup>8</sup>; Salazar-Martinez, 2006<sup>10</sup> Egypt | Not engaged in sports Males and Females: 62.30% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure No |
| Sharara, 2018<sup>8</sup>; Shady, 2012<sup>10</sup> Egypt | < 4 hours/week Males and Females: 65.5% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure No |
| Sharara, 2018<sup>8</sup>; GSHS, 2011<sup>108</sup> Lebanon | < 60 min per day on five or more days during the past seven days Males and Females: 65.4% | Included: PA data not overlapping with previously included Males and Females: 34.6% |
| Sharara, 2018<sup>8</sup>; GSHS, 2011<sup>108</sup> Lebanon | < 60 min per day on five or more days during the past seven days Males: 57.6% Females: 72.3% | Excluded: Total sample size not provided. Could not be included in the MA No |
| Sharara, 2018<sup>8</sup>; Nasreddine, 2014<sup>109</sup> Lebanon | Moderate intensity activities included: playground activities, brisk walking, dancing, and bicycling riding. Higher intensity activities included: ball games, jumping rope, active games involving running and chasing, and swimming Males and Females: 32.6% | Included: PA data not overlapping with previously included Males and Females: 67.4% |
| Sharara, 2018<sup>8</sup>; GSHS, 2012<sup>110</sup> Iraq | < 60 min per day on five or more days during the past seven days Males and Females: 80% | Included: PA data not overlapping with previously included Males and Females: 20% |
| Sharara, 2018<sup>8</sup>; GSHS, 2012<sup>110</sup> Iraq | < 60 min per day on five or more days during the past seven days Males: 74.7% Females: 86.4% | Excluded: Total sample size not provided. Could not be included in the MA No |
| Sharara, 2018<sup>8</sup>; GSHS oPt Gaza, 2010<sup>111</sup> Palestine | < 60 min per day on five or more days during the past seven days Males and Females: 75.8% | Included: PA data not overlapping with previously included Males and Females: 24.2% |
| Sharara, 2018<sup>8</sup>; GSHS oPt Gaza, 2010<sup>111</sup> Palestine | < 60 min per day on five or more days during the past seven days Males: 74.7% Females: 86.4% | Excluded: Total sample size not provided. Could not be included in the MA No |
| Sharara, 2018<sup>8</sup>; GSHS oPt West Bank, 2010<sup>112</sup> Palestine | < 60 min per day on five or more days during the past seven days Males and Females: 81.7% | Included: PA data not overlapping with previously included Males and Females: 18.3% |
| Sharara, 2018<sup>8</sup>; oPt West Bank, 2010<sup>112</sup> Palestine | < 60 min per day on five or more days during the past seven days Males: 77.2% Females: 86.5% | Excluded: Total sample size not provided. Could not be included in the MA No |
| Sharara, 2018<sup>8</sup>; Al Sabbah, 2007<sup>113</sup> Palestine | < 60 min/day, <5/7 days per week Males and Females: 80% | Included: PA data not overlapping with previously included Males and Females: 20% |
| Sharara, 2018<sup>8</sup>; Jildeh, 2011<sup>114</sup> Palestine | <5 days per week active in sport for at least one hour + mode of transport to and from school** Males and Females: 77.6% | Included: PA data not overlapping with previously included Males and Females: 13.5% |
| Sharara, 2018<sup>8</sup>; GSHS, 2011<sup>115</sup> Qatar | < 60 min per day on five or more days during the past seven days Males: 80.1% Females: 89.8% | Excluded: Total sample size not provided. Could not be included in the MA No |
| Sharara, 2018<sup>8</sup>; GSHS, 2011<sup>115</sup> Qatar | < 60 min per day on five or more days during the past seven days Males: 89.1% Females: 88.8% | Excluded: Total sample size not provided. Could not be included in the MA No |
| Sharara, 2018<sup>8</sup>; Moukhlyer, 2008<sup>117</sup> Sudan | Not engaging in sports activities Males and Females: 33.4% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure No |
| Study                                                                 | Description                                                                 | Prevalence | MA Prevalence | Comments                                                                 |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------|------------|---------------|-------------------------------------------------------------------------|
| Sharara, 2018; GSHS, 2010                                           | < 60 min per day on five or more days during the past seven days            | Males: 84.9% |               | Included: PA data not overlapping with previously included             |
| Sharara, 2018; GSHS, 2010                                           | < 60 min per day on five or more days during the past seven days            | Males: 81.9% |               | Excluded: Total sample size not provided. Could not be included in the MA |
| Sharara, 2018; GSHS, 2008                                           | < 60 min per day on all seven days during the past seven days              | Males: 84.8% |               | Included: PA data not overlapping with previously included             |
| Sharara, 2018; GSHS, 2008                                           | < 60 min per day on all seven days during the past seven days              | Males: 83.2% |               | Excluded: Total sample size not provided. Could not be included in the MA |
| Sharara, 2018; GSHS, 2008                                           | < 60 min per day on all seven days during the past seven days              | Males: 81.5% |               | Included: PA data not overlapping with previously included             |
| Sharara, 2018; GSHS, 2008                                           | < 60 min per day on all seven days during the past seven days              | Males: 73.8% |               | Excluded: Total sample size not provided. Could not be included in the MA |
| Sharara, 2018; Nouira, 2014                                         | Doesn’t do recommended PA                                                  | Males: 88.1% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Sharara, 2018; Aounallah-Skhir, 2012                                | < 3 Mets                                                                   | Males: 29.4% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Sharara, 2018; Abbès, 2016                                          | Not engaged in sports                                                     | Males: 92.8% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Sharara, 2018; Abbès, 2016                                          | >3hrs watching TV, video games, computers **                               | Males: 71.67% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Mabry, 2016; Sharara, 2018                                          | <1680 METs-min per week                                                   | Males: 44.5% |               | Included: PA data not overlapping with previously included             |
| Al-Hazzaa, 2018; Al-Hazzaa, 2007                                   | <10000 step counts per day                                                | Males: 72.9% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Al-Hazzaa, 2018; Al-Hazzaa, 2007                                    | Daily heart rate <159 bpm for atleast 20 min/day                           | Males: 85%  |               | Included: PA data not overlapping with previously included             |
| Al-Hazzaa, 2018; Al-Hazzaa, 2007                                    | Daily heart rate <140 bpm for atleast 30min/day                            | Males: 57.1% |               | Excluded: PA data overlapping with previously included data             |
| Sisson, 2008; Al-Hazzaa, 2018                                       | <13000 step counts                                                        | Male: 47.1% |               | Included: PA data not overlapping with previously included             |
| Al-Hazzaa, 2018; Al-Kutbe, 2017                                     | <10000 step counts/ day                                                   | Females: 54.4% |               | Included: PA data not overlapping with previously included             |
| Al-Hazzaa, 2018; Al-Rukban, 2003                                    | Any bodily movement produced by skeletal muscles that resulted in energy expenditure above the basal level for at least 20 minutes per session** <3 times/ week | Males: 72.3% |               | Included: Used a non-standard definition, could not be converted to PA prevalence measure |
| Al-Hazzaa, 2018; Tahar, 2008                                         | <30 min for <4 days/ week                                                 | Males: 54.4% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Al-Hazzaa, 2018; Mahfouz, 2012                                      | <30 min of PA in previous week                                            | Males: 25.7% |               | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure |
| Al-Hazzaa, 2018; Alzahrani, 2014                                    | <60 min, 5 day/week                                                       | Males: 63.7% |               | Included: PA data not overlapping with previously included             |
| Study                                      | Physical Activity | Males:  | Included: PA data not overlapping with previously included | Males: |
|-------------------------------------------|-------------------|---------|-----------------------------------------------------------|--------|
| Al-Hazzaa, 2018; Alsubaie, 2015          | Moderate to vigorous PA for 60 min/ day** <5 days a week   | 20.1%   | Included: PA data not overlapping with previously included | 79.9%  |
| Bajamal, 2017                             | Sum of moderate to vigorous activity score during the past 7 days** | Females: low | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |
| Al-Hazzaa, 2018; Al-Raddadi, 2018        | <150 min per week | Females: 86.1% | Included: PA data not overlapping with previously included | Females: 13.9% |
| Bcheraoui, 2013                           | <420 MET-min/week | Males and Females: 55.71% | Excluded: Used a non-standard definition, could not be converted to PA prevalence measure | No     |

**Notes:** From the total number of 7 studies with physical inactivity data (reported alone or with PA data), only 2 studies, with physical inactivity data not overlapping with an included PA data, were included. A total of eight data points on physical inactivity, from these 2 studies of Guthold, 2008 and Khuwaja, 2010, in three different MENA countries were added to PA activity data and used for the meta-analyses among ADULTS. No converted data from physical inactivity to PA among YOUTH was included. The 2 publications have reported nil and mild/poor PA levels (considered as physical inactivity) among youth was Wasfi, 2007 and Mehairi, 2013. These later reported also acceptable/moderate and high/good physical activity levels among youth that were already included in the PA table 3. Physical inactivity prevalence measures not converted to PA have already been included PA data and were not excluded from the quantitative data.

† Prevalence measure reported in the original study
‡ Prevalence measure calculated using the original study data

**Abbreviations:**
- UAE: United Arab Emirates
- MET: Metabolic Equivalent of task
- min: Minutes
- Wk: week
- PA: Physical activity
- d: day
- d-1: per day
- MPA: Moderate Physical Activity
- VPA: Vigorous Physical Activity
Table S6: List of excluded overlapping studies and combined outcome measures.

| List of overlapping publications, among adults, excluded from the meta-analyses (number of excluded=13): |
|---------------------------------------------------------------|
| 1) The publication of Al-Nozha et al 2007 was included in the SR of Sisson et al, 2008, Al Hazzaa, 2018, Sharara, 2018 and Mabry et al, 2016. Data from Al-Nozha et al 2007 was used only one time in the same meta-analysis group. (n=4) |
| 2) The publication of Al-Hazzaa et al 2007 was included in the SR of Mabry et al 2010 and Mabry et al, 2016. Data from Al-Hazzaa et al 2007 was used only one time in the same meta-analysis group. (n=1) |
| 3) The publication of Amin, 2011 was included in the SR of Al Hazzaa, 2018 and Sharara, 2018. Data from Amin, 2011 was used only one time in the same meta-analysis group. (n=1) |
| 4) The publication of Awadalla, 2014 was included in the SR of Mabry et al, 2016 and Al Hazzaa, 2018. Data from Awadalla, 2014 was used only one time in the same meta-analysis group. (n=2) |
| 5) The publication of Ministry of Health, Saudi Arabia, 2005 was included in the SR of Mabry et al 2010 and Sharara, 2018. Data from Ministry of Health, Saudi Arabia, 2005 was used only one time in the same meta-analysis group. (n=1) |
| 6) The publication of Guthold, 2008 (Tunisia) was included in the SR Sharara, 2018 and Sisson et al, 2008. The publication of Guthold, 2008 (UAE) was included in the SR Sharara, 2018 and Sisson et al, 2008. Data from Guthold, 2008 was used only one time in the same meta-analysis group. (n=1) |
| 7) The publication of Khalaf A, 2013 was included in the SR Mabry, 2016 and Al Hazzaa, 2018. Data from Khalaf A, 2013 was used only one time in the same meta-analysis group. (n=1) |
| 8) The publication of Allam, 2012 was included in the SR Mabry, 2016 and Al Hazzaa, 2018. Data from Allam, 2012 was used only one time in the same meta-analysis group. (n=1) |
| 9) The publication of Bener, 2004 was included in the SR Mabry, 2010 and Al Sharara, 2018. Data from Bener, 2004 was used only one time in the same meta-analysis group. (n=1) |

Note: The publication was used only one time in the same subgroup. In case of overlapping publications, the publication with the most comprehensive extracted data and the highest sample size was prioritized.
List of overlapping data, among adults, excluded from the meta-analyses (only one study on the same population was included, number of excluded=2):

1. The PA data of Al-Mahroos et al 2001138 was overlapping with PA data used in Al-Mahroos et al 1998139. This was retained for the analysis as the used definition for physical activity participation is concordant with the standard definition. (n=1)

2. Both Al Thani, 2015140 and WHO-STEPs survey, 2012141 included data on PA from WHO-STEPs survey on Qatari females. Only data from WHO-STEPs survey, 2012, including a higher sample size, was included (n=1)

List of publications using non-standard definitions, among adults, excluded from the meta-analyses (number of excluded= 37):

1) Amine, 199613 was excluded because they used a non-standard definition of physical activity.
2) Al-Baghl, 200818 was excluded because they used a non-standard definition of physical activity.
3) Memish, 201419 was excluded because they used a non-standard definition of physical activity.
4) Almursheh, 200920 was excluded because they used a non-standard definition of physical activity.
5) Al-Quaiz, 200921 was excluded because they used a non-standard definition of physical activity.
6) Al-Sennany, 201522 was excluded because they used a non-standard definition of physical activity.
7) Aballe, 200627 was excluded because they used a non-standard definition of physical activity.
8) McIlvenny, 200028 was excluded because they used a non-standard definition of physical activity.
9) Sabri, 200429 was excluded because they used a non-standard definition of physical activity.
10) Ahmed, 201330 was excluded because they used a non-standard definition of physical activity.
11) Al-Zenki, 201231 was excluded because they used a non-standard definition of physical activity.
12) Naser Al-Isa, 201132 was excluded because they used a non-standard definition of physical activity.
13) Zindah, 200833 was excluded because they used a non-standard definition of physical activity.
14) Centers for Disease Control, Prevention, 200334 was excluded because they used a non-standard definition of physical activity.
15) Kulwic, 200135 was excluded because they used a non-standard definition of physical activity.
16) Madanat, 200636 was excluded because they used a non-standard definition of physical activity.
17) Mohanand, 200837 was excluded because they used a non-standard definition of physical activity.
18) Abolfotooh, 200738 was excluded because they used a non-standard definition of physical activity.
19) Kamel, 201339 was excluded because they used a non-standard definition of physical activity.
20) Mahfouz, 201440 was excluded because they used a non-standard definition of physical activity.
21) Al-Tannir, 200841 was excluded because they used a non-standard definition of physical activity.
22) Mushharrafieh, 200842 was excluded because they used a non-standard definition of physical activity.
23) Tohme, 200543 was excluded because they used a non-standard definition of physical activity.
24) Abdul-Rahim, 200344 was excluded because they used a non-standard definition of physical activity.
25) Abu-Mourad, 200845 was excluded because they used a non-standard definition of physical activity.
26) Hamadeh, 200046 was excluded because they used a non-standard definition of physical activity.
27) Al Ali, 201147 was excluded because they used a non-standard definition of physical activity.
28) Al-Hazzaa, 199048 was excluded because they used a non-standard definition of physical activity.
29) Al-Gelban, 200849 was excluded because they used a non-standard definition of physical activity.
30) Gawkad, 200850 was excluded because they used a non-standard definition of physical activity.
31) Majeed, 201551 was excluded because they used a non-standard definition of physical activity.
32) Al-Shahri, 199852 was excluded because they used a non-standard definition of physical activity.
33) Al Alwan, 201353 was excluded because they used a non-standard definition of physical activity.
34) Taha, 199854 was excluded because they used a non-standard definition of physical activity.
35) Khalid, 199555 was excluded because they used a non-standard definition of physical activity.
36) Al-Rafeae, 200156 was excluded because they used a non-standard definition of physical activity.
37) El Beheroui, 201657 was excluded because they used a non-standard definition of physical activity.

List of overlapping publications, among youth, excluded from the meta-analyses (number of excluded=2):


1) The publication of Al-Hazzaa, 2011 was included in the SR of Al-Hazzaa, 2018, Sharara, 2018, Mabry et al, 2016. Data from Al-Hazzaa, 2011 was used only one time in the same meta-analysis group. (n=2)

### List of overlapping data, among youth, excluded from the meta-analyses (only one study on the same population was included, number of excluded=6):

1) The PA data from Al-Hazzaa, 2014, Al-Hazzaa, 2011, Al-Hazzaa, 2013, Al-Hazzaa, 2013, included in the SR of Mabry et al, 2016, were overlapping. Only data from Al-Hazzaa, 2011, with the highest sample size, were retained. (n=3)
2) The PA data from Al-Nakeeb, 2012 and Al-Naaim, 2012, included in the SR of Mabry, 2016, were overlapping. Only data from Al-Naaim, 2012, with the highest sample size, were retained. (n=1)
3) The PA data from Mehairi, 2013 and Mehairi, 2013, included in the SR of Yammine, 2016 were overlapping. Only data from Mehairi, 2013, with males and females stratified results and the highest sample size, were retained. (n=1)
4) Guthold, 2010 is overlapping with data from GSHS Libya, 2007, GSHS Djibouti, 2007, GSHS Morocco, 2010, Only data from GSHS Libya, 2007, GSHS Djibouti, 2007, GSHS Morocco, 2010, with males and females stratified results and the highest sample size. (n=0)
5) GSHS Egypt 2006 is overlapping with data from Guthold, 2010. Data from Guthold, 2010 for Egypt with stratified sample sizes were retained. (n=0)
6) The PA data from Hazzaa, 2002 is overlapping with data from Al-Hazzaa, 1993. Only data from Al-Hazzaa, 1993, with males stratified results and the highest sample size, were retained (n=1)

### List of publications using non-standard definitions, among youth, excluded from the meta-analyses (number of excluded= 22):

1) AlBuhairan, 2015 was excluded because they used a non-standard definition of physical activity.
2) Al-Muhammed, 2015 was excluded because they used a non-standard definition of physical activity.
3) Al-Mutairi, 2015 was excluded because they used a non-standard definition of physical activity.
4) Al-Othman, 2012 was excluded because they used a non-standard definition of physical activity.
5) Mehfouz, 2011 was excluded because they used a non-standard definition of physical activity.
6) Afifi, 2006 was excluded because they used a non-standard definition of physical activity.
7) Mushaig, 2014 was excluded because they used a non-standard definition of physical activity.
8) Shehab, 2009 was excluded because they used a non-standard definition of physical activity.
9) Haddad, 2009 was excluded because they used a non-standard definition of physical activity.
10) Salazar-Martinez, 2006 was excluded because they used a non-standard definition of physical activity.
11) Shady, 2015 was excluded because they used a non-standard definition of physical activity.
12) Moukyhier, 2008 was excluded because they used a non-standard definition of physical activity.
13) Nouri, 2014 was excluded because they used a non-standard definition of physical activity.
14) Aounallah-Skhiri, 2012 was excluded because they used a non-standard definition of physical activity.
15) Abbes, 2016 was excluded because they used a non-standard definition of physical activity.
16) Al-Hazzaa, 2007 was excluded because they used a non-standard definition of physical activity.
17) Al-Kutbe, 2017 was excluded because they used a non-standard definition of physical activity.
18) Al-Shekban, 2013 was excluded because they used a non-standard definition of physical activity.
19) Taha, 2008 was excluded because they used a non-standard definition of physical activity.
20) Mehfouz, 2012 was excluded because they used a non-standard definition of physical activity.
21) Bajramal, 2017 was excluded because they used a non-standard definition of physical activity.
22) El Cberouat, 2013 was excluded because they used a non-standard definition of physical activity.

Abbreviations:
- PA Physical activity
- SR Systematic review
Table S7: Quality assessment (QA) checklist for the original studies (Maximum score of 21).

| QA_Criteria’s name                     | QA_Criteria’s scoring (Max score of 3/ criteria) | QA_Criteria’s definition                                                                                                                                 |
|----------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| QA_Population_characteristics          | 0 Not defined                                   | Missing all characteristics listed below                                                                                                                                                                      |
| Used variables from the reporting tables: type population, age groups | 3 Clearly defined (1 point for each population characteristic) | The following characteristics were specified:  
   a) Nationality (1 point)  
   b) Population type (general or specific population of students, nurses,) (1 point)  
   c) Adults/youth/ age group/adolescents (1 point) |
| QA_Outcome_definition                  | 0 Not defined                                   | No definition                                                                                                                                                                                                 |
| Used variables from the reporting tables: Physical activity definition in the study | 1 Unclear non-standard definition | Any incomplete /partial definition of the outcome without details on the time and duration  
   No specification of the included sedentary/ sitting activities using or not mean time as final measure, Didn’t used mean time/day as final measure,  
   Any sedentary behavior outcome definition using a cut-off to report the prevalence of the sedentary behavior (e.g. vigorous physical activity level: high score of physical activity, sedentary (6h+)) |
|                                         | 2 Clear non-standard definition                 | Physical activity:  
   The stated definition of physical activity or inactivity is clear (time and duration) but not consistent with international recommendations  
   Example: number of steps/day  
   Even if some studies have reported that the steps count could be equivalent to > 60 minutes moderate activity in youth, they do not all agree on the threshold steps count. The reason we consider this definition non-standard.  
   Sedentary behavior  
   Any clear definition (time and duration) of only one type of sedentary behavior using mean time/day or week (e.g. mean time spent watching TV only) |
|                                         | 3 Standard definition (Clearly stated definition of PA/sedentary behavior/ inactivity consistent with international recommendations for the general population from the WHO and similar organizations with published physical activity guidelines) | Any used measure should be converted in international units (min or hrs/d, min or hrs/wk, METS, or PAL)  
   General population exclude pregnant and lactating women  
   Physical activity  
   Infants aged 3-5: 3 hours per day of high-impact, dynamic, short duration exercise  
   Youth aged 5–17: = or > 60 minutes of moderate to vigorous intensity physical activity per day  
   Adults aged 18–64: = or >150 minutes of moderate-intensity aerobic PA/week  
   OR = or >75 minutes of vigorous-intensity aerobic physical activity/week  
   OR An equivalent combination of moderate and vigorous-intensity activity  
   OR = or > 30 minutes of moderate to vigorous activity, 3 or more days/week |
Sedentary behavior and sedentary activities are similar but not synonymous. Sedentary activity includes standing but not sedentary behavior.

Data on sitting should be reported as median values and interquartile ranges. To-date there are few data on sedentary (sitting) behaviors and no well-accepted thresholds for data presented as categorical levels. 148

| QA Measurement methodology | 0 Not defined | The used instrument was not defined |
|-----------------------------|--------------|-----------------------------------|

| Physical inactivity: | An absence of physical activity or exercise 157 OR Insufficient amounts of PA (under the recommended levels (minutes or hours/d, minutes or hours/week, METS, PAL)) 161,162 OR Not achieving 180 minutes of PA of any intensity per day among 1-4 years [45] 163 |

| Sedentary behavior: | Minutes spent in sedentary activities on a typical day. Any waking behavior with an energy expenditure of ≤1.5 METs, such as sitting and reading or watching television, or standing quietly. Sedentary activities include: Minutes spent in sedentary activities on a typical day Sedentary time, screen time, sitting time, etc. 41,161 OR Daily PAL value 1.40-1.69 156 |

To be considered clear definition of sedentary behavior the following information should be reported:

1. Mean total time spent sitting including sitting at work, in an office, reading, watching television, using a computer, doing hand craft like knitting, resting etc. Should not include time spent sleeping. 148

2. Period of sedentary behavior assessment is usually per day 148 (Could be deduced from any specified period)

OR > 30 minutes of moderate-intensity physical activity on most days of the week 158
OR Daily PAL Active or moderately active lifestyle = 1.70-1.99 156 Daily PAL Vigorous or vigorously active lifestyle = 2.00-2.40 156
OR 500 to 1,000 MET-minutes per week of aerobic physical activity 41
OR 3 or more days of vigorous-intensity activity of at least 20 minutes per day 148
OR 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day 148
OR 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum 148
OR Total physical activity of at least 600 MET-minutes/week 148,159,160

Physical inactivity:

- An absence of physical activity or exercise 157
- Insufficient amounts of PA (under the recommended levels (minutes or hours/d, minutes or hours/week, METS, PAL)) 161,162
- Not achieving 180 minutes of PA of any intensity per day among 1-4 years [45] 163

| Sedentary behavior: | Minutes spent in sedentary activities on a typical day. Any waking behavior with an energy expenditure of ≤1.5 METs, such as sitting and reading or watching television, or standing quietly. Sedentary activities include: Minutes spent in sedentary activities on a typical day Sedentary time, screen time, sitting time, etc. 41,161 OR Daily PAL value 1.40-1.69 156 |

To be considered clear definition of sedentary behavior the following information should be reported:

1. Mean total time spent sitting including sitting at work, in an office, reading, watching television, using a computer, doing hand craft like knitting, resting etc. Should not include time spent sleeping. 148

2. Period of sedentary behavior assessment is usually per day 148 (Could be deduced from any specified period)
### Used variables from the reporting tables: Physical activity instrument or used items

| 1 | A non-validated questionnaire (subjective) | Use of a non-validated and non-standard questionnaire not included in the list of the 83 validated questionnaires available at [https://epi.grants.cancer.gov/paq/validation.html](https://epi.grants.cancer.gov/paq/validation.html) |
|---|---|---|
| 2 | Validated questionnaire (subjective) | Use of a validated standard physical activity or inactivity/sedentary behavior instrument included in the list of the 83 validated questionnaires available at [https://epi.grants.cancer.gov/paq/validation.html](https://epi.grants.cancer.gov/paq/validation.html) |
| 3 | A gold standard (objective) | Used and objective instrument, such as, accelerometer (gold standard) or pedometer |

### QA_Setting

| 0 | Not defined/ not clearly defined | No definition |
| 3 | National coverage clearly defined | Local or national geographical coverage clearly defined: name or number of the city or governorate, university, school, households Urban or Rural |

### QA_Timing

| 0 | Not defined | Data collection time not stated |
| 3 | Clearly defined | Data collection time stated |

### QA_Sampling

| 0 | Not defined | Not stated |
| 1 | Unclear | Self-selection or unclear method |
| 2 | Non-random sampling | Clearly defined non-random sampling method (e.g. Convenient) |
| 3 | Random sampling | Clearly defined random sampling |

### QA_Response_rate

For each reported data point if only global response rate is reported, the response rate per strata (male/female) would be missing

| 0 | Not defined | The response rate was not reported for the study population for which the prevalence was reported e.g. the males and female’s response rate are different than the response rate for the whole study population. |
| 1 | <49% | Low response rate |
| 2 | 50-79% | Acceptable response rate in this context |
| 3 | >=80% | Standard response rate |

### Notes:

- The quality appraisal was based on the reported primary studies data as reported in the SR and the original primary study.
- Only PA recommendations for the general population were considered.
- Populations from Tunisia and Pakistan are predominantly national. The specification of the nationality was not used as criteria to score the population characteristics in these countries.
- Low levels of PA were scored according to the physical inactivity recommended definitions.
- Metabolic equivalent of task (MET): “A unit that represents the metabolic cost of physical activity. One MET is the rate of energy expenditure while sitting at rest, which, for most people approximates an oxygen uptake of 3.5 ml per kg per min. The energy expenditure of other activities is expressed in multiples of METs. For example, for the average adult, sitting and reading requires about 1.3 METs, strolling or walking slowly requires about 2.0 METs, and running at 5 miles per hour requires about 8.3 METS” [41].
- Physical activity level (PAL): “the total energy expenditure (TEE) for 24 hours expressed as a multiple of basal metabolic rate (BMR), and calculated as TEE/BMR for 24 hours.” [156] Data on sitting should be reported as median values and interquartile ranges. To-date there are no well-accepted thresholds for data presented as categorical levels [148]. Also, there is no standard guidelines setting the minimum sedentary time required to classify a person as having a sedentary behaviour. The reported sedentary outcome was scored clear only if the mean or median total sedentary time of sedentary activities with an energy expenditure of ≤1.5 METs’ (such as, mean time spent watching TV, reading, screen time, sitting time, or sedentary time without specification) was reported. Studies with sedentary prevalence measures, using any threshold, were considered unclear.
- Quality assessment criteria were not applied to odd ratios and prevalence ratios and pooled prevalence.
- Abbreviations: QA: Quality assessment.
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collectio n | Population | Physical activity definition/stud y | Physical activity instrument or used items | Instrument administrati on | Age group (years) | Prevalenc e of physical activity (%) | Gender | Sample size ♀/♂ (%) | Res p- rate (%) | QA score (21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|-----------------------------------|------------------------------------------|-------------------------------|-----------------|-------------------------------------|---------|-------------------------|-----------------|------|
| **Saudi-Arabia (number of studies = 11)** | Sisson, 2008 | Al-Nozha, 2007 | CS** | MCRS** | National level | 1995-00 | Saudi participants in the Public-School Coronary Artery Disease Study | Active ≥600 METmin/wk | PA questionnaire ** | Self-reported (Face-to-face interviews* *) | 30-70 | 3.9** | Male and Femal e | 17395 ** | Equal ** | N/S | 16 |
| | Sisson, 2008 | Al-Nozha, 2007 | CS** | MCRS** | National level | 1995-00 | Saudi participants in the Public-School Coronary Artery Disease Study | Active ≥600 METmin/wk | PA questionnaire ** | Self-reported (Face-to-face interviews* *) | 30-70 | 6 | Male | 8297* | 48** | N/S | 16 |
| | Sisson, 2008 | Al-Nozha, 2007 | CS** | MCRS** | National level | 1995-00 | Saudi participants in the Public-School Coronary Artery Disease Study | Active ≥600 METmin/wk | PA questionnaire ** | Self-reported (Face-to-face interviews* *) | 30-70 | 2 | Femal e | 9098* | 52** | N/S | 16 |
| | Mabry, 2010 | Ministry of Health, Saudi Arabia, 2005 | World Health Survey (CS**) | MCRS** | National level | 2004** | Saudi general population | At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Face-to-face interviews | 25-64 | 32.65* | Male and Femal e | 4758 | Equal | 97.7 | 20 |
| | Mabry, 2010 | Ministry of Health, Saudi Arabia, 2005 | World Health Survey (CS**) | MCRS** | National level | 2004** | Saudi general population | At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Face-to-face interviews | 25-64 | 39.0 | Male | 2284* | 48 | N/S | 17 |
| | Mabry, 2010 | Ministry of Health, Saudi Arabia, 2005 | World Health Survey (CS**) | MCRS** | National level | 2004** | Saudi general population | At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Face-to-face interviews | 25-64 | 26.3 | Femal e | 2474* | 52 | N/S | 17 |
| | Mabry, 2010 | Al-Nozha, 2007 | CS** | MCRS | National level | 1995-00** | Saudi general population | Active 600 or more MET min/wk | Instrument included items regarding | Face-to-face interviews | 30-70 | 3.9* | Male and | 17395 | Equal | 99 | 19 |
| Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | ☀/♂ (%) | Response rate (%) | QA score (/21) |
|-------------|----------------|---------|--------------------------|------------|----------------------------------|---------------------------------------------|--------------------------|----------------|----------------------------------|--------|--------------|---------|----------------|-----------|
| Mabry, 2010 | Al-Nozha, 2007 | CS** | MCRS | National-level | Saudi general population | Active 600 or more MET-min/wk | Instrument included items regarding sports and leisure activities | Face-to-face interviews | 30-70 | 6.1 | Male | 8350* | 48 | N/S | 16 |
| Mabry, 2010 | Al-Nozha, 2007 | CS** | MCRS | National-level | Saudi general population | Active 600 or more MET-min/wk | Instrument included items regarding sports and leisure activities | Face-to-face interviews | 30-70 | 1.9 | Femal e | 9045* | 52 | N/S | 16 |
| Mabry, 2010 | Al-Hazzaa, 2007 | N/S | RS | Riyadh | Saudi general population | At least 600 MET-min/wk of vigorous or moderate activity | IPAQ (Short version**) | Telephone interviews | 15-78 | 59.5* | Male and Femal e | 1064 | 66 | 19 |
| Mabry, 2010 | Al-Hazzaa, 2007 | N/S | RS | Riyadh | Saudi general population | At least 600 MET-min/wk of vigorous or moderate activity | IPAQ (Short version**) | Telephone interviews | 15-78 | 56.3 | Male | 702* | 66 | N/S | 17 |
| Mabry, 2010 | Al-Hazzaa, 2007 | N/S | RS | Riyadh | Saudi general population | At least 600 MET-min/wk of vigorous or moderate activity | IPAQ (Short version**) | Telephone interviews | 15-78 | 65.7 | Femal e | 362* | 34 | N/S | 17 |
| Mabry, 2016 | Al-Hazzaa, 2007 | Population-based survey | Simple RS** | Riyadh** | Saudi** adult general population | 150 min of moderate-intensity PA/wk | IPAQ short version | Telephone interviews* | 15-78 | 59.40 | Male and Femal e | 1064 | 66* | 19 |
| Mabry, 2016 | Al-Hazzaa, 2007 | Population-based survey | Simple RS** | Riyadh** | Saudi** adult general population | 150 min of moderate-intensity PA/wk | IPAQ short version | Telephone interviews* | 15-78 | 56.3 | Male | 702** | 66** | N/A | 17 |
| Mabry, 2016 | Al-Hazzaa, 2007 | Population-based survey | Simple RS** | Riyadh** | Saudi** adult general population | 150 min of moderate-intensity PA/wk | IPAQ short version | Telephone interviews* | 15-78 | 65.7 | Femal e | 362** | 34** | N/A | 17 |
| Systematic review source | Study reference | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administrati on | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Respirate (%) | QA score (%) |
|--------------------------|-----------------|--------------|-----------------|---------|--------------------------|------------|----------------------------------|---------------------------------------------|---------------------------------|-----------------|------------------------------|--------|-------------|---------------|-------------|
| Mabry, 20167              | Allam, 2012 71  | Populati on-based survey (CS**) | Systematic randomization | Taibah University, Madinah  ** | 2011** | Saudi** medical students | 150 min of moderate-intensity PA/wk | IPAQ short version | Self-administrat ed ** | Adults | 35.50                      | Male and Femal e | 194 | 97*         | 20           |
| Mabry, 20167              | Allam, 2012 71  | Populati on-based survey (CS**) | Systematic randomization** | Taibah University, Madinah  ** | 2011** | Saudi** medical students | 150 min of moderate-intensity PA/wk | IPAQ short version | Self-administrat ed ** | Adults | 36.2                       | Male | 94** | 96*         | 18           |
| Mabry, 20167              | Allam, 2012 71  | Populati on-based survey (CS**) | Systematic randomization** | Taibah University, Madinah  ** | 2011** | Saudi** medical students | 150 min of moderate-intensity PA/wk | IPAQ short version | Self-administrat ed ** | Adults | 35.0                       | Femal e | 100** | 100 **      | 18           |
| Mabry, 20167              | Al-Nozha, 2007 12 | Populati on-based survey (CS**) | MCRS** | National-level** | 1995-00** | Saudi **adult general population | 150 min of moderate-intensity PA/wk | Validated questionnaire on leisure time PA and walking † | Face-to-face interviews* * | 30-70 | 3.9**                      | Male and Femal e | 17395 | Equal **    | N/S          | 16           |
| Mabry, 20167              | Al-Nozha, 2007 12 | Populati on-based survey (CS**) | MCRS** | National-level** | 1995-00** | Saudi **adult general population | 150 min of moderate-intensity PA/wk | Validated questionnaire on leisure time PA and walking † | Face-to-face interviews* * | 30-70 | 6.1                        | Male | 8297** * | 48**        | N/S          | 16           |
| Mabry, 20167              | Al-Nozha, 2007 12 | Populati on-based survey (CS**) | MCRS** | National-level** | 1995-00** | Saudi **adult general population | 150 min of moderate-intensity PA/wk | Validated questionnaire on leisure time PA and walking † | Face-to-face interviews* * | 30-70 | 1.9                        | Femal e | 9098* * | 52**        | N/S          | 16           |
| Mabry, 20167              | Awadalla, 2014 68 | Populati on-based survey (CS**) | RCS** | King Khalid University** | 2012-13** | Health professional college students | 150 min of moderate-intensity PA/wk | IPAQ short version | Self-administrat ed ** | Adults (17-25**) | 42.0                       | Male and Femal e | 1257 | 85.6 **     | 19           |
| Mabry, 20167              | Awadalla, 2014 68 | Populati on-based survey (CS**) | RCS** | King Khalid University** | 2012-13** | Health professional college students | 150 min of moderate-intensity PA/wk | IPAQ short version | Self-administrat ed ** | Adults (17-25 **) | 43.7                       | Male | 426** | 33.9*       | N/A          | 16           |
| Mabry, 20167              | Awadalla, 2014 68 | Populati on-based survey (CS**) | RCS** | King Khalid University** | 2012-13** | Health professional college students | 150 min of moderate-intensity PA/wk | IPAQ short version | Self-administrat ed ** | Adults (17-25 **) | 41.2                       | Femal e | 831** | 66.1*       | N/A          | 16           |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/ study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Resp. rate (%) | QA score (/%) |
|--------------------------|--------------|--------------|----------------|---------|--------------------------|------------|--------------------------------------|------------------------------------------|-------------------------|----------------|-------------------------------------|--------|-------------|----------------|---------------|
| Mabry, 2016² | Banday, 2015² | Population based survey (CS**) | Voluntary ** | Primary health care centers and general hospitals of Sakaka and Dumat Al-Jandal areas of Aljouf region** | N/S | Primary Health care Physicians | 150 min of moderate-intensity PA/wk | GPAQ | Face-to-face interviews* | 27-63 | 65.20 | Male and Female | 106 | 64* | 13 | |
| Mabry, 2016² | Banday, 2015² | Population based survey (CS**) | Voluntary ** | Primary health care centers and general hospitals of Sakaka and Dumat Al-Jandal areas of Aljouf region** | N/S | Primary Health care Physicians | 150 min of moderate-intensity PA/wk | GPAQ | Face-to-face interviews* | 27-63 | 66.3** | Male | 92** | 86** | N/A | 11 |
| Mabry, 2016² | Banday, 2015² | Population based survey (CS**) | Voluntary ** | Primary health care centers and general hospitals of Sakaka and Dumat Al-Jandal areas of Aljouf region** | N/S | Primary Health care Physicians | 150 min of moderate-intensity PA/wk | GPAQ | Face-to-face interviews* | 27-63 | 57.1** | Female | 14** | 13** | N/A | 11 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Response rate (%) | QA score (/21) |
|--------------------------|-------------|-----------------|---------|--------------------------|------------|----------------------------------|---------------------------------|------------------------|----------------|----------------------------------|--------|-------------|------------------|--------------|
| Mabry, Khalaf, 2016<sup>7</sup> | Populati on-based survey (CS**)<sup>37</sup> | MCRS**<sup>11</sup> | Universit y centre for women’s studies in southwest ern**<sup>27</sup> | 2010** | Female university students | 150 min of moderate-intensity PA/wk | ATLS | Self-administrat ed ** | Adults | 62.4 | Female | 663 | N/A | 94.7 ** | 19 |
| Mabry, Khalaf, 2016<sup>7</sup> | Populati on-based survey (CS**)<sup>37</sup> | MCRS**<sup>11</sup> | Universit y of Dammam **<sup>27</sup> | 2005-06** | Women college students | 150 min of moderate-intensity PA/wk | GPAQ | Face-to-face interviews* | Adults | 46.8 | Female | 370 | N/A | 28** * | 17 |
| UAE (number of studies = 3) | | | | | | | | | | | | | | | |
| Mabry, World Health Organizati on, 2010<sup>4</sup> | Survey*<sup>37</sup> | RS from national populatio n register | National-level | 2003** | Emirati general population | At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Face-to-face interviews | ≥18 | 61.7 | Male and Femal e | 1180 | ♂<sup>♂♀</sup> | 72.0 | 19 |
| Mabry, World Health Organizati on, 2010<sup>4</sup> | Survey*<sup>37</sup> | RS from national populatio n register | National-level | 2003** | Emirati general population | At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Face-to-face interviews | ≥18 | 66.5 | Male | 850* | 72 | N/A | 17 |
| Mabry, World Health Organizati on, 2010<sup>4</sup> | Survey*<sup>37</sup> | RS from national populatio n register | National-level | 2003** | Emirati general population | At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Face-to-face interviews | ≥18 | 49.3 | Femal e | 330* | 28 | N/A | 17 |
| Yammin e, 2016<sup>6</sup> | N/S | RS | UAE Universit y**<sup>27</sup> | N/S | University students | Vigorous level of PA - (Severe participation in physical exercises**)<sup>27</sup> | Personal PA questionnaire | Face-to-face interviews with students or their parents**<sup>27</sup> | 17-24 | 4.40 | Femal e | 206 | N/A | N/S | 11 |
| Mabry, Carter, 2003<sup>169</sup> | Populati on-based survey (CS**)<sup>37</sup> | N/S | Faculty of Medicine and Health Sciences, UAE | 2000** | Medical students | 150 min of moderate-intensity PA/wk | Nurses’ Health Study II ‡<sup>27</sup> | Self-administrat ed ** | 19-27 | 67.0 | Male and Femal e | 175 | ♂<sup><♀</sup>* | 84 for those present and | 15 |
| Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | ♂/♀ (%) | Response rate (%) | QA score (/21) |
|-------------|-----------------|---------|-------------------------|------------|---------------------------------|---------------------------------------------|------------------------|-----------------|-------------------------------|--------|--------------|---------|-----------------|-------------|
| University ** | Oman World Health Survey* | National level** | 2008** | Adults (Omani household**) | 150 min of moderate-intensity PA/wk | GPAQ | N/S | 18+ | 63.4 | Male and Female | 3137 | ♂/♀* | 86.3 ** | 20 |
| Mabry, 2016 | El-Aty, 2014 ** | | | | | | | | | | | | |
| Mabry, 2016 | El-Aty, 2014 ** | | | | | | | | | | | | |
| Mabry, 2016 | El-Aty, 2014 ** | | | | | | | | | | | | |
| Bahrain (number of studies = 2) | | | | | | | | | | | | | |
| Mabry, 2010 | Al-Mahroos, 1998 ** | Systematic RS | National-level | 1995-96** | Bahraini general population | Active: energy expenditure >0.3 MJ d-1 (Equivalent to walking daily for 30 min at 5km/h**)) | Instrument contained questions on walking, cycling and recreational activities based on which energy expenditure was calculated | Face-to-face interviews | 40-69 | 13.8 | Male and Female | 2128 | ♂/♀ | 59.0 | 17 |
| Mabry, 2010 | Al-Mahroos, 1998 ** | Systematic RS | National-level | 1995-96** | Bahraini general population | Active: energy expenditure >0.3 MJ d-1 (Equivalent to walking daily for 30 min at 5km/h**)) | Instrument contained questions on walking, cycling and recreational activities based on which energy expenditure was calculated | Face-to-face interviews | 40-69 | 23.1 | Male | 1297* | 59 | N/S | 15 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size ♂/♀ (%) | Response rate (%) | QA score (/21) |
|--------------------------|-------------|----------------|---------|--------------------------|------------|-----------------------------------|---------------------------------------------|-------------------------------|----------------|------------------------------------|---------|-----------------------------|-----------------|------------|
| Mabry, 2010<sup>4</sup> | Al-Mahroos, 1998<sup>139</sup> | N/S | Systematic RS | National-level | 1995-96** | Bahraini general population | Instrument contained questions on walking, cycling and recreational activities based on which energy expenditure was calculated | Face-to-face interviews | 40-69 | 1.3 | Female | 901* | 41 | N/S | 15 |
| Mabry, 2010<sup>4</sup> | Al-Mahroos, 2001<sup>138</sup> | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d-1 | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 40-59 | 35** | Male | 1168* | 58** | N/S | 12 |
| Mabry, 2010<sup>4</sup> | Al-Mahroos, 2001<sup>138</sup> | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d-1 | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 40-49 | 36 | Male | 668** | N/A | N/S | 12 |
| Mabry, 2010<sup>4</sup> | Al-Mahroos, 2001<sup>138</sup> | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d-1 | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 50-59 | 32 | Male | 500** | N/A | N/S | 12 |
| Mabry, 2010<sup>4</sup> | Al-Mahroos, 2001<sup>138</sup> | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d-1 | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 50-69 | 6.1** | Female | 845** | 42** | N/S | 12 |
| Mabry, 2010<sup>4</sup> | Al-Mahroos, 2001<sup>138</sup> | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d-1 | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 60-69 | 5 | Female | 377** | N/A | N/S | 12 |

Expenditure was calculated.
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Res.-rate (%) | QA score (/21) |
|--------------------------|-------------|-----------------|---------|--------------------------|------------|-----------------------------------|---------------------------------------------|-------------------------------|-----------------|-----------------------------------|---------|-------------|----------------|--------------|
| Mabry, 2010⁴ Al-Mahroos, 2001 ¹³⁸ | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d⁻¹ | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 50-59 | 7 | Female | 468** | N/A | N/S | 12 |
| Mabry, 2010⁴ Sharara, 2018⁹ | Al-Mahroos, 2001 ¹³⁸ | CS** | Systematic RS | National-level | N/S | Bahraini general population | Active: walk ≥1 km d⁻¹ | Instrument contained WHO Heart and Health Questionnaire (validated in Arabic***) | Face-to-face interviews | 40-69 | 22.9%** | Male and Female | 2013* | 70 | ♂>♀ | 14 |
| Kuwait (number of studies = 1) | | | | | | | | | | | | | |
| Mabry, 2010⁴ | Ministry of Health, Kuwait, 2006 ¹⁷¹ | World Health Survey (CS**) | RSS | National-level | 2006** | Kuwaiti general population | At least 600 MET-min/wk of vigorous or moderate activity | IPAQ | Face-to-face interviews | 20-65 | 35.3 | Male and Female | 2280 | ♂<♀ | 77.6 | 19 |
| Mabry, 2010⁴ | Ministry of Health, Kuwait, 2006 ¹⁷¹ | World Health Survey (CS**) | RSS | National-level | 2006** | Kuwaiti general population | At least 600 MET-min/wk of vigorous or moderate activity | IPAQ | Face-to-face interviews | 20-65 | 42.1 | Male | 912* | 40 | 72.2 | 19 |
| Mabry, 2010⁴ | Ministry of Health, Kuwait, 2006 ¹⁷¹ | World Health Survey (CS**) | RSS | National-level | 2006** | Kuwaiti general population | At least 600 MET-min/wk of vigorous or moderate activity | IPAQ | Face-to-face interviews | 20-65 | 28.4 | Female | 1368* | 60 | 81.6 | 20 |
| Qatar (number of studies = 2) | | | | | | | | | | | | | |
| Mabry, 2010⁴ Sharara, 2018⁹ | Bener, 2004 ¹³⁷ | CS** | MCRS | National-level | 2003** | Qatari general population | Active: walked or cycled for at least 30 min d⁻¹ | Instrument contained a question if person walked or cycled at least 30 min d⁻¹ | Face-to-face interviews | 25-65 | 43.5* | Male and Female | 1208 | ♂<♀ | 80.5 | 18 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Resp-rate (%) | QA score (/21) |
|--------------------------|-------------|----------------|---------|--------------------------|------------|-----------------------------------|---------------------------------------------|--------------------------|----------------|-----------------------------------|--------|-------------|---------------|-------------|
| Mabry, 2010; Sharara, 2018 | CS**        | MCRS           | National-level | 2003** | Qatari general population | Active: walked or cycled for at least 30 min d-1 | Instrument contained a question if person walked or cycled at least 30 min d-1 | Face-to-face interviews | 25-65 | 49.2 | Male | 507* | 42 | N/A | 15 |
| Mabry, 2010; Sharara, 2018 | CS**        | MCRS           | National-level | 2003** | Qatari general population | Active: walked or cycled for at least 30 min d-1 | Instrument contained a question if person walked or cycled at least 30 min d-1 | Face-to-face interviews | 25-65 | 39.5 | Female | 701* | 58 | N/A | 15 |
| Al Thani, 2015 | Qatar Stepwise survey* | MCMS | National level ** | 2012** | Qatari** women | 150 min of moderate-intensity PA/wk | GPAQ | Face-to-face interviews | 18-64 | 44.2 | Female | 747 | N/A | 88* | 20 |

Notes: All non-reported data was searched and extracted from the original study. Any additional information found relevant in the original study was added to the reported data for the purpose of completeness.
If not reported, the prevalence of the outcome among the total study population (males and/or females) was calculated using row and/or calculated data available in the original study. The calculated prevalence measure was reported and marked using two stars (**). If not reported, the total sample size for each gender strata was calculated based on the percentage of males or females in the sample. If not reported, the number for cases in each gender strata was calculated based on the reported prevalence and the total sample size in the strata. If not reported, the total number for cases in the entire sample was calculated by the addition of the number of cases in each reported stratum. If any discordance between the reported data in the SR and data available in the original study, this later was retained.

Abbreviations: SR: Systematic review; PA: Physical activity; VPA: Vigorous physical activity; MPA: Moderate physical activity; KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates; USA: United States of America; GCC: Gulf cooperation council; MENA: Middle-East and North Africa; QA: Quality assessment; ATLS: Arab teens lifestyle student questionnaire; GPAQ: Global Physical Activity Questionnaire; IPAQ: International Physical Activity Questionnaire; CS: Cross sectional; MCRS: Multistage stratified/cluster random sampling; RS: Random sampling; RCS: Random cluster sampling; RSS: Random stratified sampling; MET: Metabolic Equivalent of Task; VG: Video games; Resp-rate: response rate; N/S: Not stated; N/A: Not applicable;

Symbols:
† The use of a validated questionnaire was not reported in the original study.
‡ The use of Nurses’ Health Study II questionnaire was not reported in the original study.
* Calculated from reported data in the SR
** Calculated or reported from data in the original study
*** Calculated from the prevalence measure reported in the original study (different from the prevalence measure reported in the SR)
♂: Males; ♀: Females; km: Kilometer; min: Minutes; wk: Week; d: Day; d-1: Per day; hrs: hours; h: hour
MJ: The megajoule is equal to one million (106) joules; Energy expenditure of >0.3 MJ/day is equivalent to walking daily for half an hour at 5 km/h.
Table S9: The prevalence of physical activity among the youth general population of the included MENA countries.

| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Male | Female | Sex ratio (% | Resp-rate (%) | QA score (/21) |
|-------------------------|-------------|-------------|----------------|---------|--------------------------|------------|----------------------------------|---------------------------------------------|---------------------------|----------------|--------------------------------------|---------|--------------|------|--------|--------------|----------------|---------------|
| Saudi-Arabia (number of studies = 6) |
| Sisson, 2008 | Al-Hazzaa, 2007 | N/S | RS** | Riyadh | 2005** | Saudi public-school children | Active ≥13,000 steps/d | Pedometers | Objectively measured | 8-12 | 53 | Male | 296 | N/A | N/S | 18 |
| Mabry, 2016 | Al-Hazzaa, 2014 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 15-19 | 31.50 | Male | 2866 | Equa l** | N/S | 16 |
| Mabry, 2016 | Al-Hazzaa, 2014 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 15-19 | 43.8 | Male | 1384* | 48.3* | N/S | 16 |
| Mabry, 2016 | Al-Hazzaa, 2011 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 15-19 | 20.2 | Female | 1482* | 51.7* | N/S | 16 |
| Mabry, 2016 | Al-Hazzaa, 2011 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 14-19 | 38.1** | Male and Female* | 2908 | Equa l** | N/S | 17 |
| Mabry, 2016 | Al-Hazzaa, 2011 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 14-19 | 55.5 | Male | 1401* | 48.2* | N/S | 17 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 14-19 | 21.9 | Female | 1507* | 51.8* | N/S | 17 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 15-19 | 37.8** | Male and Female* | 2886 (2888 **) | Equa l** | 99.2* | 20 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah | 2009-10** | Secondary school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 15-19 | 55.0 | Male | 1388* | 48.1* | (base d on | N/S | 17 |
| Study source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical activity definition/study | Physical activity instrument or used items | Instrument administratio n | Age group (years) | Prevalenc e of physical activity (%) | Gende r | Sampl e size | Resp -rate (%) | QA score (/21) |
|--------------|--------------|-----------------|---------|--------------------------|-------------|-----------------------------------|---------------------------------------------|---------------------------------|----------------|-----------------------------------|---------|--------------|--------------|-------------|
| Mabry, 2016\(^7\) Al-Hazzaa, 2013 \(^{144}\) | Population-based survey (CS**)) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009- 10** | Saudi** school students | 60 min of moderate-intensity 7 d/wk | ATLS | Self-administrated ** | 15-19 | 21.7 | Female | 1500* * | 51.9* * | (base d on a total samp le size of 2888 ) | N/S | 17 |
| Mabry, 2016\(^7\) Al-Hazzaa, 2013 \(^{144}\) | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009- 10** | Saudi** school students | 60 min of moderate-intensity 7 d/wk | ATLS | Self-administrated ** | 15-19 | 76.0** | Male and Female | 2822* * | Equa l** | 99.2* * | N/S | 20 |
| Mabry, 2016\(^7\) Al-Hazzaa, 2013 \(^{144}\) | Population-based survey (CS**) | MCRS** | Al-Khobar and Riyadh ** | 2009- 10** | Saudi** school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 14-18 | 36.0 ( 35.7**)) | Male and Female | 1648** | Equa l** | N/S | 14 |
| Mabry, 2016\(^7\) Al-Hazzaa, 2013 \(^{144}\) | Population-based survey (CS**) | MCRS** | Al-Khobar and Riyadh ** | 2009- 10** | Saudi** school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 14-18 | 53.4 | Male | 797** | 48.4* * | N/S | 14 |
| Mabry, 2016\(^7\) Al-Hazzaa, 2013 \(^{144}\) | Population-based survey (CS**) | MCRS** | Al-Khobar and Riyadh ** | 2009- 10** | Saudi** school students | 60 min of moderate-intensity 7 d/wk | ATLS | N/S | 14-18 | 19.1 | Female | 851** | 51.6* * | N/S | 14 |
| Mabry, 2016\(^7\) Al-Nakeeb, 2012 \(^{146}\) | Population-based survey (N/S) ** | RSS** | Al-brahim ** | N/S | School students | 60 min of moderate-intensity 7 d/wk | ATLS | Self-administrated ** | 15-17 | 26.0 | Male and Female | 2290 (UK+ KSA* *) | Equa l** | N/S | 13 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | ©/♂ (%) | Resp -rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|----------------|---------|-------------------------|------------|-----------------------------------|-------------------------------------|-------------------------------|----------------|----------------------------------|--------|----------------|-----------|---------------|----------------|
| **Yammine, 2016**        | Al-Nakeeb, 2016 | Population-based survey (N/S**) | RSS**           | N/S    | School students         | 60 min of moderate-intensity 7 d/wk | ATLS       | Self-administrate d **             | 15-17               | 45.8           | Male                            | 576**   | 52.0*         | N/S      | 13             |                |
| **Yammine, 2016**        | Al-Nakeeb, 2016 | Population-based survey (N/S**) | RSS**           | N/S    | School students         | 60 min of moderate-intensity 7 d/wk | ATLS       | Self-administrate d **             | 15-17               | 4.5            | Female                          | 531**   | 48.0*         | N/S      | 13             |                |
| **Yammine, 2016**        | Al-Nuaim, 2012 | Population-based survey (CS**) | RS**            | N/S    | Secondary** school students | 60 min of moderate-intensity 7 d/wk | ATLS       | Self-administrate d **             | 15-19               | 25.1**         | Male and Female*                 | 1270    | Equa 1**       | N/S      | 13             |                |
| **Yammine, 2016**        | Al-Nuaim, 2012 | Population-based survey (CS**) | RS**            | N/S    | Secondary** school students | 60 min of moderate-intensity 7 d/wk | ATLS       | Self-administrate d **             | 15-19               | 44.5           | Male                            | 663**   | 52.2*         | N/S      | 13             |                |
| **Yammine, 2016**        | Al-Nuaim, 2012 | Population-based survey (CS**) | RS**            | N/S    | Secondary** school students | 60 min of moderate-intensity 7 d/wk | ATLS       | Self-administrate d **             | 15-19               | 4.0            | Female                          | 607**   | 47.8*         | N/S      | 13             |                |

**UAE (number of studies = 4)**

| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | ©/♂ (%) | Resp -rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|----------------|---------|-------------------------|------------|-----------------------------------|-------------------------------------|-------------------------------|----------------|----------------------------------|--------|----------------|-----------|---------------|----------------|
| **Yammine, 2016**        | Guthold, 2010 | GSHS**       | Two-stage**    | National level** | 2005**    | Adolescents             | Moderate level of physical activity – (At least 60 min of PA per day on at least 5 days per week**) | Adolescent PA measure questionnair e (PACE+:**) | Self-administrate d **  | 14 (mean ) | 19.7**             | Male and Female* | 9916*   | Equa 1       | 88.3*     | 18             |                |
| **Yammine, 2016**        | Guthold, 2010 | GSHS**       | Two-stage**    | National level** | 2005**    | Adolescents             | Moderate level of physical activity – (At least 60 min of PA per day on at least 5 days per week**) | Adolescent PA measure questionnair e (PACE+:**) | Self-administrate d **  | 14 (mean ) | 27                 | Male                | 4849    | 48.9*        | N/S       | 15             |                |
| **Yammine, 2016**        | Guthold, 2010 | GSHS**       | Two-stage**    | National level** | 2005**    | Adolescents             | Moderate level of physical activity – (At least 60 min of PA per day on at least 5 days per week**) | Adolescent PA measure questionnair e (PACE+:**) | Self-administrate d **  | 15 (mean ) | 18                 | Female              | 5067    | 51.1*        | N/S       | 15             |                |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Populatio n | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | ♂/♀ (%) | Resp -rate (%) | QA score (/21) |
|--------------------------|-------------|--------------|----------------|---------|--------------------------|-------------|-----------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------|----------------------------------|--------|-------------|----------|---------------|-------------|
| Yammine, 2016⁶ | Mheiriri, 2013 ¹⁴ | CS** | RS | Al Ain Abu Dhabi** | 2010** | School students | Moderate level of PA – (Moderate score of PA**) | IPAQ short version | Self-administrate d ** | 12-18 | 29.3** | Male and Femal e | 1018* | Equa l | 68.3* | 15 |
| Yammine, 2016⁶ | Mheiriri, 2013 ¹⁴ | CS** | RS | Al Ain Abu Dhabi** | 2010** | School students | Moderate level of PA – (Moderate score of PA**) | IPAQ short version | Self-administrate d ** | 12-18 | 27.4 | Male | 522 | 51.6* | N/S | 15 |
| Yammine, 2016⁶ | Mheiriri, 2013 ¹⁴ | CS** | RS | Al Ain Abu Dhabi** | 2010** | School students | Moderate level of PA – (Moderate score of PA**) | IPAQ short version | Self-administrate d ** | 12-18 | 31.2 | Femal e | 496 | 48.4* | N/S | 15 |
| Yammine, 2016⁶ | Muhairi, 2013 ¹⁵ | CS** | RS | Al Ain Abu Dhabi** | 2010** | School students | Moderate level of PA – (Moderate score of PA**) | IPAQ short version | Self-administrate d ** | 15-18 | 32.4 | Male and Femal e | 315 | Equa l | N/S | 15 |
| Yammine, 2016⁶ | Wasfi, 2008 ¹⁶ | Survey** | RSS** | Bur Dubai and Deira** | 2010** | Secondary school students | Moderate level of PA - (Vigorous exercise < 3 times/wk for about 60 min and > 30 min of moderate PA most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 8.9* | Male and Femal e* | 1475* | 56.6* | N/S | 15 |
| Yammine, 2016⁶ | Wasfi, 2008 ¹⁶ | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Moderate level of PA - (Vigorous exercise < 3 times/wk for about 60 min and > 30 min of moderate PA most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 11.7 | Male | 835 | 56.6* | N/S | 15 |
| Yammine, 2016⁶ | Wasfi, 2008 ¹⁶ | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Moderate level of PA - (Vigorous exercise < 3 times/wk for about 60 min and > 30 min of moderate PA most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 5.2 | Femal e | 640 | 43.4* | N/S | 15 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Resp-rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|-------------------------|------------|----------------------------------|--------------------------|----------------|-----------------------------------|---------|-------------|----------------|--------------|
| Yammine, 2016<sup>6</sup> | Muhairi, 2013<sup>14</sup> | CS** | RS | Al Ain | 2010** | School students | Vigorous level of PA-(High score of PA**) | IPAQ short version | 12-18 | 34.4** | Male and Female | 1018* | Equa1 | 68.3* | 17 |
| Yammine, 2016<sup>6</sup> | Muhairi, 2013<sup>14</sup> | CS** | RS | Al Ain | 2010** | School students | Vigorous level of PA –(High score of PA**) | IPAQ short version | 12-18 | 47.1 | Male | 522 | Equa1 | 51.6* | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Muhairi, 2013<sup>15</sup> | CS** | RS | Al Ain | 2010** | School students | Vigorous level of PA –(High score of PA**) | IPAQ short version | 12-18 | 21.0 | Female | 496 | Equa1 | 48.4* | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Wasfi, 2008<sup>16</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | School students | Vigorous level of PA-(Vigorous exercise ≥ 3 times/wk for about 20 min/session and also > 30 min of moderate PA most days of the week **) | Personal PA questionnaires | 14-18 | 21.1* | Male and Female | 1475* | Equa1 | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Wasfi, 2008<sup>16</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Vigorous level of PA-(Vigorous exercise ≥ 3 times/wk for about 20 min/session and also > 30 min of moderate PA most days of the week **) | Personal PA questionnaires | 14-18 | 26.0 | Male | 835 | Equa1 | 56.6* | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Wasfi, 2008<sup>16</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Vigorous level of PA-(Vigorous exercise ≥ 3 times/wk for about 20 min/session and also > 30 min of moderate PA) | Personal PA questionnaires | 14-18 | 14.7 | Female | 640 | Equa1 | 43.4* | N/S | 15 |
| Systematic review source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical activity definition/study | Physical activity instrument or used items | Instrument administratio n | Age group (years) | Prevalenc e of physical activity (%) | Gende r | Sampl e size | ♂/♀ (%) | Resp -rate (%) | QA score |
|--------------------------|-------------|-----------------|---------|--------------------------|-------------|-----------------------------------|-------------------------------------------|-------------------------------|----------------|-------------------------------|--------|---------------|---------|---------------|---------|
| Yammine, 2016<sup>6</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Emirati secondary school students | Moderate level of PA - (Vigorous exercise < 3 times/week for about 60 min and > 30 min of moderate physical activity most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 12.9 | Male and Female | 233 | Uncl ear| N/S | 16 |
| Yammine, 2016<sup>6</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Emirati secondary school students | Vigorous level of PA - (Vigorous exercise ≥ 3 times/wk for about 20 min/session and also > 30 min of moderate PA most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 33.9 | Male and Female | 233 | Uncl ear| N/S | 16 |
| Yammine, 2016<sup>6</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Non-Emirati secondary school students | Moderate level of PA - (Vigorous exercise < 3 times/week for about 60 min and > 30 min of moderate physical activity most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 8.1 | Male and Female | 1242 | Uncl ear| N/S | 16 |
| Yammine, 2016<sup>6</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Non-Emirati secondary school students | Vigorous level of PA - (Vigorous exercise ≥ 3 times/wk for about 20 min/session and also > 30 min of moderate PA most days of the week**) | Personal PA questionnaires | Self-administrate d ** | 14-18 | 18.7 | Male and Female | 1242 | Uncl ear| N/S | 16 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Resp-rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|--------------------------------------|-----------------------------------------------|--------------------------|-----------------|-------------------------------------|---------|-------------|---------------|-------------|
| Oman (number of studies = 2) | | | | | | | | | | | | | | | | |
| Mabry, 2016<sup>7</sup> | Kilani, 2013<sup>173</sup> | Population-based survey (CS**) | MCRS** | Muscat** | 2010** | Adolescents (Secondary school students **) | 60 min of moderate-intensity 7 d/wk | ATLS | Face-to-face interviews** | 15-18 | 42.6** | Male and Female* | 802 | $♂<♀$ | N/S | 16 |
| Mabry, 2016<sup>7</sup> | Kilani, 2013<sup>173</sup> | Population-based survey (CS**) | MCRS** | Muscat** | 2010** | Adolescents (Secondary school students **) | 60 min of moderate-intensity 7 d/wk | ATLS | Face-to-face interviews** | 15-18 | 66.7 | Male | 360** | 44.9* | N/S | 16 |
| Mabry, 2016<sup>7</sup> | Kilani, 2013<sup>173</sup> | Population-based survey (CS**) | MCRS** | Muscat** | 2010** | Adolescents (Secondary school students **) | 60 min of moderate-intensity 7 d/wk | ATLS | Face-to-face interviews** | 15-18 | 23.1 | Female | 442** | 55.1* | N/S | 16 |
| Yammine, 2016<sup>6</sup> | Guthold, 2010<sup>$10$</sup> | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14 (mean) | 25.4** | Male and Female** | 2158* | Equa | 97 | 18 |
| Yammine, 2016<sup>6</sup> | Guthold, 2010<sup>$10$</sup> | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14 (mean) | 34 | Male | 1133 | 52.5 | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Guthold, 2010<sup>$10$</sup> | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14 (mean) | 16 | Female | 1025 | 47.5 | N/S | 15 |

Kuwait (number of studies = 1)
| Systematic study source | Study design | Sampling method | Setting | Years of data collection | Population description | Physical activity definition/measure | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Resp-rate (%) | QA score |
|-------------------------|-------------|----------------|---------|--------------------------|------------------------|--------------------------------------|--------------------------|-----------------|------------------------------------|--------|-------------|---------------|---------|
| Mabry, 2016<sup>7</sup> | Population-based survey (CS**<sup>2</sup>) | MCRS**<sup>2</sup> | 6 Kuwaiti Governmental schools** | 2009** | Adolescents (Kuwaiti secondary school students**<sup>2</sup>) | 60 min of moderate-intensity 7 d/wk | ATLS ** | 14-19 | 55.2** | Male and Female* | 906 | Equa 1** | N/S | 14 |
| Mabry, 2016<sup>7</sup> | Population-based survey (CS**<sup>2</sup>) | MCRS**<sup>2</sup> | 6 Kuwaiti Governmental schools** | 2009** | Adolescents (Kuwaiti secondary school students**<sup>2</sup>) | 60 min of moderate-intensity 7 d/wk | ATLS ** | 14-19 | 70.5 | Male | 463** | 51.1* | N/S | 14 |
| Mabry, 2016<sup>7</sup> | Population-based survey (CS**<sup>2</sup>) | MCRS**<sup>2</sup> | 6 Kuwaiti Governmental schools** | 2009** | Adolescents (Kuwaiti secondary school students**<sup>2</sup>) | 60 min of moderate-intensity 7 d/wk | ATLS ** | 14-19 | 39.2 | Female | 443** | 48.9* | N/S | 14 |

**Djibouti (number of studies = 1)**

| Yammine, 2016<sup>6</sup> | Guthold, 2010 $<sup>10</sup>$ | GSHS**<sup>2</sup> | Two-stage RS | National level** | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 14.4 (mean) | 16.9** | Male and Female* ** | 882** | $♂<♀$ | 83 | 18 |
| Yammine, 2016<sup>6</sup> | Guthold, 2010 $<sup>10</sup>$ | GSHS**<sup>2</sup> | Two-stage RS | National level** | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 14.4 (mean) | 21 | Male | 526 | 59.6 | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Guthold, 2010 $<sup>10</sup>$ | GSHS**<sup>2</sup> | Two-stage RS | National level** | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 14.4 (mean) | 11 | Female | 356 | 40.4 | N/S | 15 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population size | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Response rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|----------------|-----------------------------------|---------------------------------|-----------------------------|----------------|----------------------------------|--------|-------------|----------------|----------------|
| **Egypt (number of studies = 1)** | | | | | | | | | | | | | | | |
| Yammine, 2016 | Guthold, 2010 | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 13.5 (mean) | 9.4 | Male and Female | 3664* | ♂ > ♀ | 87 | 18 |
| Yammine, 2016 | Guthold, 2010 | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 13.5 (mean) | 14 | Male | 1975 | 53.9 | N/S | 15 |
| Yammine, 2016 | Guthold, 2010 | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 13.5 (mean) | 4 | Feminale | 1689 | 46.1 | N/S | 15 |
| **Jordan (number of studies = 1)** | | | | | | | | | | | | | | | |
| Yammine, 2016 | Guthold, 2010 | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 17.4** | Male and Femal | 1719* | Equa | 95 | 18 |
| Yammine, 2016 | Guthold, 2010 | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 20 | Male | 829 | 48.2 | N/S | 15 |
| Yammine, 2016 | Guthold, 2010 | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical | Self-administered | 14.4 (mean) | 15 | Feminale | 890 | 51.8 | N/S | 15 |
| Study source | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size ♀/♂ (%) | Response rate (%) | QA score (/21) |
|--------------|-----------------|---------|--------------------------|------------|-----------------------------------|-------------------------------------------|---------------------------|-----------------|-----------------------------------|---------|---------------------|--------------------|--------------|
| Yammine, 2016 | Two-stage RS     | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 13.9 (mean) | 18** | Male and Female** | 1354* | Equa l | 98** | 18 |
| Yammine, 2016 | Two-stage RS     | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 13.9 (mean) | 24 | Male | 163 | 50.3 | N/S | 15 |
| Yammine, 2016 | Two-stage RS     | National level | 2005 | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 13.9 (mean) | 12 | Female | 81 | 49.7 | N/S | 15 |

Libya (number of studies = 1)
| Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical activity definition/study | Physical activity instrument or used items | Instrument administration | Age group (years) | Prevalence of physical activity (%) | Gender | Sample size | Resp-rate (%) | QA score (/21) |
|--------------|--------------|-----------------|---------|--------------------------|------------|-----------------------------------|---------------------------------------------|--------------------------|----------------|-------------------------------|--------|-------------|--------------|---------------|
| Yammine, 2016\(^6\) | Guthold, 2010 \(^10\) | GSHS** | Two-stage RS | National level | Schoolchildren | At least 60 min of PA per day on at least 5 days per week | Validated PACES\(^+\) and Adolescent physical activity measure questionnaire | Self-administered | 14.1 (mean) | 13 | Female | 809 | 46.6 | N/S | 15 |

**Notes:** All non-reported data was searched and extracted from the original study. Any additional information found relevant in the original study was added to the reported data for the purpose of completeness.

If not reported, the prevalence of the outcome among the total study population (males and/or females) was calculated using row and/or calculated data available in the original study. The calculated prevalence measure was reported and marked using two stars (**) .

If not reported, the total sample size for each gender strata was calculated based on the percentage of males or females in the sample.

If not reported, the number for cases in each gender strata was calculated based on the reported prevalence and the total sample size in the strata.

If not reported, the total number for cases in the entire sample was calculated by the addition of the number of cases in each reported stratum.

If any discordance between the reported data in the SR and data available in the original study, this later was retained.

**Abbreviations:** SR: Systematic review; PA: Physical activity; VPA: Vigorous physical activity; MPA: Moderate physical activity; KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates; USA: United States of America; GCC: Gulf cooperation council; MENA: Middle-East and North Africa; QA: Quality assessment; ATLS: Arab teens lifestyle student questionnaire; GPAQ: Global Physical Activity Questionnaire; IPAQ: International Physical Activity Questionnaire; CS: Cross sectional; MCRS: Multistage stratified/cluster random sampling; RS: Random sampling; RCS: Random cluster sampling; RSS: Random stratified sampling; MET: Metabolic Equivalent of Task; VG: Video games; GSHS: Global School-based Student Health Survey; Resp-rate: response rate; N/S: Not stated; N/A: Not applicable;

**Symbols:**
† The use of a validated questionnaire was not reported in the original study.
‡ The use of Nurses’ Health Study II questionnaire was not reported in the original study.
* Calculated from reported data in the SR
** Calculated or reported from data in the original study
*** Calculated from the prevalence measure reported in the original study (different from the prevalence measure reported in the SR)
\(^\dagger\) This study was included in the SR of Yammine, 2016\(^6\). PA data extracted from this study of Guthold, 2010 \(^10\) was not reported by the SR of Yammine, 2016\(^6\).
♂: Males; ♀: Females; km: Kilometer; min: Minutes; wk: Week; d: Day; d-1: Per day; hrs: hours; h: hour
MJ: The megajoule is equal to one million (10\(^6\)) joules
Energy expenditure of >0.3 MJ/day is equivalent to walking daily for half an hour at 5 km/h.
Table S10: Physical inactivity and sedentary behavior among the adult general population of the included MENA countries.

| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Res. rate (%) | QA score (21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|-----------------------------|-----------------|-----------------------------------------------|---------|-------------|----------------|----------------|
|                          |              |              |                 |         |                          |            |                                                          |                                                               |                             |                 |                                |         |             |                |               |
| Saudi-Arabia (number of studies = 34) |              |              |                 |         |                          |            |                                                          |                                                               |                             |                 |                                |         |             |                |               |
| Sisson, 2008; Sharara, 2018; Al-Hazzaa, 2018 | Al-Nozha, 2007 | CS** | MCR S** | National-level | 1995-00 | Saudi participants in the Public-School Coronary Artery Disease Study | Inactive: <600 METmin/wk | PA questionnaire** | Self-reported (Face-to-face interviews**) | 30-70 | 96.1%** | Male and Female | 17223 ** | N/S | N/S | 16 |
| Sisson, 2008; Sharara, 2018; Al-Hazzaa, 2018 | Al-Nozha, 2007 | CS** | MCR S** | National-level | 1995-00 | Saudi participants in the Public-School Coronary Artery Disease Study | Inactive: <600 METmin/wk | PA questionnaire** | Self-reported (Face-to-face interviews**) | 30-70 | 94% | Male | 8215 ** | N/S | N/S | 16 |
| Sisson, 2008; Sharara, 2018; Al-Hazzaa, 2018 | Al-Nozha, 2007 | CS** | MCR S** | National-level | 1995-00 | Saudi participants in the Public-School Coronary Artery Disease Study | Inactive: <600 MET min/wk | PA questionnaire** | Self-reported (Face-to-face interviews**) | 30-70 | 98% | Female | 9008 ** | N/S | N/S | 16 |
| Mabry, 2010 | Ministry of Health, Saudi Arabia, 2005 | World Health Survey (CS**) | MCR S | National-level* | 2004** | Saudi general population | Mean amount of time spent sitting (Mean total time spent in sedentary activities (min/d) **) | GPAQ | Face-to-face interviews | 25-64 | 279.4 min d-1** | Male and Female | 4758 | Equal | 97.7 | 20 |
| Mabry, 2010 | Ministry of Health, Saudi Arabia, 2005 | World Health Survey (CS**) | MCR S | National-level* | 2004** | Saudi general population | Mean amount of time spent sitting (Mean total time spent in sedentary activities (min/d) **) | GPAQ | Face-to-face interviews | 25-64 | 283 min d-1 | Male | 2284* | 48 | N/S | 17 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%) | Res.-rate (%) | QA score (/21) |
|--------------------------|-----------|-------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------|-----------------------------------------------|---------|-------------|--------------|--------------|--------------|
| Mabry, 2010[^4]          | Ministry of Health, Saudi Arabia, 2005[^2] | World Health Survey (CS **) | MCR S | National level* | 2004** | Saudi general population | Mean amount of time spent sitting (Mean total time spent in sedentary activities (min/d) **) | GPAQ | Face-to-face interviews | 25-64 | 276 min d-1 | Female | 2474* | 52 | N/S | 17 |
| Sharara, 2018[^9]       | Al-Baghli, 2008[^9] | A community-based screening campaign ** | All targeted population invited ** | National level (Eastern province of Saudi Arabia) ** | 2004-2005 | General adult population | No physical activity or mild physical activity (ordinary housework, walking) | Structured questionnaire | Face-to-face interviews** | 30+ | 79.2% | Male and Female ** | 197681 | N/S | 33 | 14 |
| Sharara, 2018[^9]       | Memish, 2014[^9] | Saudi Health Information Survey | MCR S** | National level (Household) ** | 2013 | Saudis nationals | Neither moderate nor vigorous PA | IPAQ | Personal interviews** | 15+ | 69.1% | Male and Female ** | 10735 | ♂<♀ | 89.4 ** | 18 |
| Sharara, 2018[^9]       | Almursheid, 2009[^20] | Case-control study ** | Select ed consecutively over 1 year* | Subnational level | 2003-2004 | Newly diagnosed colon cancer patients | No exercise | Questionnaire | N/S | 52% | Male and Female ** | 50 | Equal | N/R | 12 |
| Sharara, 2018[^9]       | Al-Senany, 2015[^22] | CS ** | NS | Subnational level (A major hospital in Jeddah) ** | N/S | Elderly individuals | Less than one-hour weekly activity | Interview questionnaire** | Interviews** | 60-90 | 69% | Male and Female ** | 55 | N/S | N/S | 6 |
| Sharara, 2018[^9]       | Amin, 2014[^23] | CS ** | Multistage proportionate sampling method | Subnational level (PHCC) ** | N/S | Adult Saudis | <30 min/≥5 days/week | GPAQ | Interviews** | 18-78 | 80% | Male and Female ** | 2127 | N/S | N/S | 14 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % | Res- p- rate (%) | QA score (%) |
|--------------------------|-------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------|-----------------------------------------------|---------|-------------|---|----------------|--------|
| **Sharara, 2018**        | CS**        | MSRS **        | Subnational level (Household) | 2004-2005 | Saudi nationals | <600 MET-min/week | GPAQ | Interviews** | 15-64 | 67% | Male and Female | ** | 4758 | Equal** | 98* | 20 |
| **Sharara, 2018**        | CS**        | MCR S**        | National level | 2004 | Adults | <600 MET-min/week | STEPS Instrument for NCD Risk Factors ** (GPAQ) | Face-to-face interviews** | 25-64 | 67.6% | Male and Female | ** | 3547 | Equal | 97.7 | 19 |
| **Sharara, 2018**        | CS**        | MCR S**        | National level | 2004 | Adults | <600 MET-min/week | STEPS Instrument for NCD Risk Factors ** (GPAQ) | Face-to-face interviews** | 25-64 | 61.0%** | Male | 1713** | 48.3 | N/S | 16 |
| **Al-Hazzaa, 2018**      | N/S         | RS             | Riyadh | 1990 | College students | No regular activity | Questionnaire | Self-reported | 21.9 (+- 2.1) | 78.2% | Male | 362 | N/A | N/S | 14 |
| **Al-Hazzaa, 2018**      | CS**        | Systeatic RS | Abha, Aseer region of Saudi Arabia | 2005/2006 | Teacher’s Training College students | <3 times/week | Questionnaire | Self-administered | 17+ | 83.3% | Male | 456 | N/A | N/S | 15 |
| **Al-Hazzaa, 2018**      | CS**        | RS             | Riyadh | March-May 2007 | College students | <3 days/week | Questionnaire | Self-administered | 21.4+-1.8 | 75.4% | Male and Female | 302 | Equal | 59.1 | 17 |
| **Al-Hazzaa, 2018**      | CS**        | RS             | Riyadh | March-May 2007 | College students | <3 days/week | Questionnaire | Self-administered | 21.4+-1.8 | 72% | Male | 150 | 49.6 | N/S | 15 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % | Respirate (%) | QA score (%) |
|-------------------------|-------------|-------------|----------------|---------|--------------------------|------------|------------------------------------------------|------------------------------------------------|--------------------------|----------------|--------------------------------|--------|-------------|----|-------------|-------------|
| Al-Hazzaa, 2018<sup>8</sup> | Gawwad, 2008<sup>66</sup> | CS** | RS | Riyadh | March-May 2007 | College students | <3 days/week | Questionnaire | Self-administered | 21.4+/-1.8 | 78.9% | Female | 152 | 50.3 | N/S | 15 |
| Al-Hazzaa, 2018<sup>8</sup> | Khalaf A, 2013<sup>67</sup> | CS** | RS | Abha | Spring 2010 | College students | <150 min/week | Validated questionnaire: ATLS | Self-reported | 20.4+/-1.5 | 37.6% | Female | 663 | N/A | N/A | 17 |
| Al-Hazzaa, 2018<sup>8</sup> / Sharara, 2018<sup>8</sup> | Awadalla , 2014<sup>68</sup> | CS** | Stratified cluster sampling | Abha | NS | College students | <600 METs-min per week | IPAQ | Self-reported | 17-25 | 58% | Male and Female | 1257 | N/S | N/S | 11 |
| Al-Hazzaa, 2018<sup>8</sup> | Awadalla , 2014<sup>68</sup> | CS** | N/S | Abha | NS | College students | <600 METs-min per week | IPAQ | Self-reported | 17-25 | 56.1% | Male | 426 | 33.8 | N/A | 11 |
| Al-Hazzaa, 2018<sup>8</sup> | Awadalla , 2014<sup>68</sup> | CS** | N/A | Abha | NS | College students | <600 METs-min per week | IPAQ | Self-reported | 17-25 | 58.8% | Female | 831 | 66.1 | N/A | 11 |
| Al-Hazzaa, 2018<sup>8</sup> | Majeed, 2015<sup>69</sup> | CS** | Stratified RS | Dammam | September to November 2013 | College students | <1 time per week | Questionnaire | Self-reported | 19.3+/-0.95 | 72.5% | Female | 215 | N/A | N/A | 15 |
| Al-Hazzaa, 2018<sup>8</sup> | Samara, 2015<sup>70</sup> | CS** | N/S | Riyadh | 2014 | College students | < 600 METs-min/week | ATLS | Self-administered | 18-22 | 44% | Female | 94 | N/A | N/A | 14 |
| Al-Hazzaa, 2018<sup>8</sup> | Allam, 2012<sup>71</sup> | CS** | N/S | Madinah | January to May 2011 | College students | <150 mins/week moderate activity or <60 min/week vigorous activity | IPAQ | N/S | 21.1+/-1.9 | 64.4% | Male and Female | 196** | Equal | 97% | 17 |
| Al-Hazzaa, 2018<sup>8</sup> | Allam, 2012<sup>71</sup> | CS** | N/S | Madinah | January to May 2011 | College students | <150 mins/week moderate activity or <60 min/week vigorous activity | IPAQ | N/S | 21.1+/-1.9 | 65% | Female | 100 | 51 | 97% | 17 |
| Al-Hazzaa, 2018<sup>8</sup> | Allam, 2012<sup>71</sup> | CS** | N/S | Madinah | January to May 2011 | College students | <150 mins/week moderate activity or <60 min/week vigorous activity | IPAQ | N/S | 21.1+/-1.9 | 63.8% | Male | 96 | 49 | 97% | 17 |
| Al-Hazzaa, 2018<sup>8</sup> | Al-Shahri, 1998<sup>72</sup> | N/S | RS | Riyadh | N/S | Primary care Physicians | No regular activity | Questionnaire | Self-administered | 42+/-6.5 | 76.5% ** | Male | 89** | N/A | 99% | 14 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%) | Res- p-rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|-------------------------|------------|------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------|---------------|-----------------------------|--------|-------------|-------------|--------------|-------------|
| Al-Hazzaa, 2018<sup>8</sup> | Al Alwan, 2013<sup>7</sup> | CS** | RS | Riyadh | July-Aug 2009 | Physicians and non-physicians | No PA | Questionnaire | Self-reported | 20+ | 43% | Male and Female | 200 | Equal | N/S | 14 |
| Al-Hazzaa, 2018<sup>8</sup> | Al Alwan, 2013<sup>7</sup> | CS** | RS | Riyadh | July-Aug 2009 | Physicians and non-physicians | No PA | Questionnaire | Self-reported | 20+ | 41% | Male | 98 | 49 | N/S | 14 |
| Al-Hazzaa, 2018<sup>8</sup> | Al Alwan, 2013<sup>7</sup> | CS** | RS | Riyadh | July-Aug 2009 | Physicians and non-physicians | No PA | Questionnaire | Self-reported | 20+ | 45% | Female | 102 | 51 | N/S | 14 |
| Al-Hazzaa, 2018<sup>8</sup> | Al Ateeq, 2014<sup>4</sup> | CS** | Stratified RS | Riyadh | Dec 2012-Feb 2013 | Primary care professionals | Active category: 30 min or more a day of moderate PA, 5 or more days a week. OR 20 min or more a day of vigorous PA, 3 or more days a week** | “How physically active are you” questionnaire | Trained nurse collected data | 39.2+-8.9 | 78.85% | Male and Female | 322 | ♂<sup><i>▼</i></sup> | N/S | 17 |
| Al-Hazzaa, 2018<sup>8</sup> | Al Ateeq, 2014<sup>4</sup> | CS** | Stratified RS | Riyadh | Dec 2012-Feb 2013 | Primary care professionals | Active category: 30 min or more a day of moderate PA, 5 or more days a week. OR 20 min or more a day of vigorous PA, 3 or more days a week** | “How physically active are you” questionnaire | Trained nurse collected data | 39.2+-8.9 | 78.7% | Male | 127 | 39.5 | N/S | 17 |
| Al-Hazzaa, 2018<sup>8</sup> | Al Ateeq, 2014<sup>4</sup> | CS** | Stratified RS | Riyadh | Dec 2012-Feb 2013 | Primary care professionals | Active category: 30 min or more a day of moderate PA, 5 or more days a week. OR 20 min or more a day of vigorous PA, 3 or more days a week** | “How physically active are you” questionnaire | Trained nurse collected data | 39.2+-8.9 | 79% | Female | 195 | 60.5 | N/S | 17 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Gender (%) | Response (%) | QA score (/21) |
|-------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|--------------------------------------------------------|---------------------------------------------------------------|--------------------------------|----------------|--------------------------------|---------|------------|-------------|-------------|----------------|
| Al-Hazzaa, 2018<sup>8</sup> | Taha, 1998<sup>142</sup> | N/S | RS | Eastern Province | N/S | Primary care patients | <3 times/ week for 20 min | Questionnaire | NS | 36.1+-12.1 | 68.3% | Male and Female | 227 | ♂<sup>♂</sup> | N/S | 12 |
| Al-Hazzaa, 2018<sup>8</sup> | Taha, 1998<sup>142</sup> | N/S | RS | Eastern Province | N/S | Primary care patients | <3 times/ week for 20 min | Questionnaire | NS | 41.5+-11.2 | 43.3% | Male | 90 | 40 | N/S | 12 |
| Al-Hazzaa, 2018<sup>8</sup> | Taha, 1998<sup>142</sup> | NS | RS | Eastern Province | NS | Primary care patients | <3 times/ week for 20 min | Questionnaire | NS | 32.5+-11.4 | 84.7% | Female | 137 | 60 | N/S | 12 |
| Al-Hazzaa, 2018<sup>8</sup> | AlQuaiz, 2009<sup>21</sup> | CS** | N/S | Riyadh | 1 March to 30 April 2007 ** | Primary care patients | Not practicing in any regular sport and leisure time physical activity** | Questionnaire | CDC web site questionnaire ** | 33.3+-13.3 | 82.4% | Male and Female | 450 | ♂<sup>♂</sup> | N/S | 13 |
| Al-Hazzaa, 2018<sup>8</sup> | AlQuaiz, 2009<sup>21</sup> | CS** | N/S | Riyadh | 1 March to 30 April 2007 ** | Primary care patients | Not practicing in any regular sport and leisure time physical activity** | Questionnaire | CDC web site questionnaire ** | 33.3+-13.3 | 87.6% | Female | 306 | 68 | N/S | 13 |
| Al-Hazzaa, 2018<sup>8</sup> | AlQuaiz, 2009<sup>21</sup> | CS** | N/S | Riyadh | 1 March to 30 April 2007 ** | Primary care patients | Not practicing in any regular sport and leisure time physical activity** | Questionnaire | CDC web site questionnaire ** | 33.3+-13.3 | 71.5% | Male | 144 | 32 | N/S | 13 |
| Al-Hazzaa, 2018<sup>8</sup> | Abozaid, 2010 <sup>76</sup> | CS** | N/S | Taif | Decemb<br>er 2005 to January 2006** | Family clinic patients | <150 min./week moderate activity or <60 min/ week vigorous activity | IPAQ | Interview-administered | 43.1+-9.3 | 46.5% | Male and Female | 329 | ♂<sup>♂</sup> | N/S | 14 |
| Al-Hazzaa, 2018<sup>8</sup> | Abozaid, 2010 <sup>76</sup> | CS** | N/S | Taif | Decemb<br>er 2005 to January 2006** | Family clinic patients | <150 min./week moderate activity or <60 min/ week vigorous activity | IPAQ | Interview-administered | 43.1+-9.3 | 46% | Male | 190 | 58 | N/S | 14 |
| Al-Hazzaa, 2018<sup>8</sup> | Abozaid, 2010 <sup>76</sup> | CS** | N/S | Taif | Decemb<br>er 2005 to January 2006** | Family clinic patients | <150 min./week moderate activity or <60 min/ week vigorous activity | IPAQ | Interview-administered | 43.1+-9.3 | 47% | Female | 139 | 42 | N/S | 14 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Res- pate (%) | Res- pate (%) |
|--------------------------|--------------|--------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------|----------------|----------------------------------------------------------|--------|-------------|--------------|--------------|
| Al-Hazzaa, 2018 / Sharara, 2018 | Amin, 2011 | CS** | Systematic RS** | Al-Hassa region | N/S | Primary healthcare patients | <600 METs-min/week | GPAQ | Trained nurse interview** | 18-64 | 47.65% | Male and Female | 2176 | ♂>♀ | 76% | 16 |
| Al-Hazzaa, 2018 | Amin, 2011 | CS** | Systematic RS** | Al-Hassa region | N/S | Primary healthcare patients | <600 METs-min/week | GPAQ | Trained nurse interview** | 32.8±10.1 | 50.5% | Male | 1209 | 55 | N/S | 16 |
| Al-Hazzaa, 2018 | Al-Hazzaa, 2018 | CS** | Systematic RS** | Al-Hassa region | N/S | Primary healthcare patients | <600 METs-min/week | GPAQ | Trained nurse interview** | 33.4±9.2 | 44.8% | Female | 967 | 45 | N/S | 16 |
| Al-Hazzaa, 2018 | Khalid, 1995 | CS** | RS** | Aseer Province | N/S | Lowlanders and highlanders | No strenuous exercise for >= 3 times per week | Lipid Research Clinic Questionnaire | N/S | 16-60 | 79.5% | Male and Female | 905 | N/S | N/S | 12 |
| Al-Hazzaa, 2018 | Khalid, 1995 | CS** | RS** | Aseer Province | N/S | Lowlanders and highlanders | No strenuous exercise for >= 3 times per week | Lipid Research Clinic Questionnaire | N/S | 16-60 | 59.4% | Male | N/S | N/S | N/S | 12 |
| Al-Hazzaa, 2018 | Khalid, 1995 | CS** | RS** | Aseer Province | N/S | Lowlanders and highlanders | No strenuous exercise for >= 3 times per week | Lipid Research Clinic Questionnaire | N/S | 16-60 | 99.5% | Female | N/S | N/S | N/S | 12 |
| Al-Hazzaa, 2018 | Bin Horaib, 2013 | CS** | MCR S** | 5 regions of Saudi Arabia | January 2009 to February 2011 | Military personnel | <30 min per day/5 days** | WHO stepwise questionnaire | Self-reported** | 18-50 | 30.8% | Male | 10229 | N/A | 97.4% | 20 |
| Al-Hazzaa, 2018 | Al-Rafae, 2001 | N/S | N/S | Riyadh | N/S | Adult population | No regular activity | Questionnaire | Self-administered | 41.1+-9.7 | 80.9% | Male | 1333 | N/A | N/S | 7 |
| Al-Hazzaa, 2018 | Al-Hazzaa, 2007 | N/S | N/S | Riyadh | Spring of 2003 | Adult population | <600 METs-min per week | IPAQ | Telephone interview | 15-78 | 40.6% | Male and Female | 1064 | ♂>♀ | 66% | 15 |
| Al-Hazzaa, 2018 | Al-Hazzaa, 2007 | N/S | N/S | Riyadh | Spring of 2003 | Adult population | <600 METs-min per week | IPAQ | Telephone interview | 15-78 | 43.7% | Male | 702 | 66 | N/A | 13 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Res:rate (%) | Res:rate (%) | Res:rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|-------------------------|------------|-----------------------------------------------|-------------------------------------------------|--------------------------------|-----------------|-----------------------------------------------|--------|-------------|-------------|-------------|-------------|----------------|
| Al-Hazzaa 2018 | Al-Hazzaa, 2007 | N/S | N/S | Riyadh | Spring of 2003 | Adult population | <600 METs-min per week | IPAQ | Telephone interview | 15-78 | 34.3% | Female | 362 | 34 | N/A | 13 |
| Al-Hazzaa 2018 | Amin, 2014 | CS** | N/S | Al-Hassa | 1st of March 2012 to May 30th, 2012 | University employee | <600 METs-min per week | WHO stepwise questionnaire | Face-to-face interview** | 40.4-9.8 | 73% | Male and Female | 691 | N/A | 33.1% | 15 |
| Al-Hazzaa 2018 | Al-Zalabani, 2015 | N/S | MCR S** | National Sample | 2005 | Adults | <600 METs-min per week of moderate, or <60 min / week vigorous activity | GPAQ | Face-to-face interview** | 15-64 | 66.6% | Male and Female | 4758** | Equal | N/S | 16 |
| Al-Hazzaa 2018 | Al-Zalabani, 2015 | N/S | MCR S** | National Sample | 2005 | Adults | <600 METs-min per week of moderate, or <60 min / week vigorous activity | GPAQ | Face-to-face interview** | 15-64 | 60.1%** | Male | 2340** | 49 | N/S | 16 |
| Al-Hazzaa 2018 | Al-Zalabani, 2015 | N/S | MCR S** | National Sample | 2005 | Adults | <600 METs-min per week of moderate, or <60 min / week vigorous activity | GPAQ | Face-to-face interview** | 15-64 | 72.9% | Female | 2418 | 51 | N/S | 16 |
| Al-Hazzaa 2018 | Al-Mountashiri, 2017 | Multistage survey* | N/S | Tabuk | Mar 2017-Jun 2017 | Healthy Adults “controls” | Questionnaire | <30 min/day, 5 days/week | Self-reported | 18-** | 66.39% | Male and Female | Unclear | N/A | 89.4%** | 19 |
| Al-Hazzaa 2018 | Albawardi, 2016 | CS** | N/S | Riyadh | N/S | Working women | <600 MET-s min per week | Modified ATLS questionnaires | Self-reported | 31.7+-8.3 | 52.1% | Female | 420 | N/A | 72% | 13 |
| Al-Hazzaa 2018 | Mandil, 2016 | CS** | RS** | Riyadh | Dec 2013-Jan 2014 | Adults, Physicians | MVPA | Modified STEPwise questionnaires | Self-administered | 24-65 | 36.9% | Male and Female | 360 | ♂>♀ | 98.6%** | 19 |
| Al-Hazzaa 2018 | Al-Mountashiri, 2017 | Case-Control | N/S | Tabuk | Mar 2017-Jun 2017 | Healthy Adults “controls” | Questionnaire | <30 min/day, 5 days/week | Face-to-face interviews | 20-65+ | 86.7% | Male and Female | 150 | ♂>♀ | N/S | 12 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Female (%) | Male (%) | Res- p-rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|----------------|---------|-------------------------|------------|---------------------------------------------------------------|---------------------------------------------------------------|----------------------------|----------------|-----------------------------------------------|--------|---------------|-------------|-----------|----------------|----------------|
| **Pakistan (number of studies = 2)** | | | | | | | | | | | | | | | | | | | | |
| Sisson, 2008³ | Guthold, 2008 ¹¹ | World Health Survey (CS***) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to- face interviews**) | 18-69 | 20%*** | Male and Female | 5610 | Equal** | 85.7 | 20 |
| Sisson, 2008³ | Guthold, 2008 ¹¹ | World Health Survey (CS***) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to- face interviews**) | 18-69 | 14% | Male | 2822*** * | 50.3 ** | N/S | 17 |
| Sisson, 2008³ | Guthold, 2008 ¹¹ | World Health Survey (CS***) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to- face interviews**) | 18-69 | 28% | Female | 2788** * | 49.7 ** | N/S | 17 |
| Ranasinghe, 2013³ | Khuwaja, 2010 ¹⁷ | CS** | Syste matic RS | Urban regions of Karachi** | N/S | Healthy non-institutionalized population (general population) | Inactivity: (<30 minutes of moderate to vigorous activity most of the days (at least 4) in last 7 days**) | IPAQ | Face-to- face interviews** | 25-64 | 60.1 % | Male and Female | 534 | Equal | 88.4 | 17 |
| Ranasinghe, 2013³ | Khuwaja, 2010 ¹⁷ | CS** | Syste matic RS | Urban regions of Karachi** | N/S | Healthy non-institutionalized population (general population) | Inactivity: (<30 minutes of moderate to vigorous activity most of the days (at least 4) in last 7 days**) | IPAQ | Face-to- face interviews** | 25-64 | 52.1 % | Male | 292 | 54.7 %** | N/S | 14 |
| Ranasinghe, 2013³ | Khuwaja, 2010 ¹⁷ | CS** | Syste matic RS | Urban regions of Karachi** | N/S | Healthy non-institutionalized population (general population) | Inactivity: (<30 minutes of moderate to vigorous activity most of the days (at least 4) in last 7 days**) | IPAQ | Face-to- face interviews** | 25-64 | 69.8 % | Female | 242 | 45.3 %** | N/S | 14 |

| Tunisia (number of studies = 2) | | | | | | | | | | | | | | | | | | | | |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Gender (♀/♂) (%) | Response rate (%) | QA score (/21) |
|--------------------------|-------------|--------------|----------------|---------|--------------------------|------------|------------------------------------------------|------------------------------------------------|--------------------------|----------------|------------------------------------------------|---------|-------------|----------------|----------------|-------------|
| Sisson, Guthold, Sharara, 2008 | Guthold, 2008 | World Health Survey (CS**) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to-face interviews**) | 18-69 | 14.6%*** | Male and Female | 4332 | Equal** | 90.1 ** | 20 |
| Sisson, Guthold, Sharara, 2008 | Guthold, 2008 | World Health Survey (CS**) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to-face interviews**) | 18-69 | 12% | Male | 2149** | 49.6 ** | N/S | 17 |
| Sisson, Guthold, Sharara, 2008 | Guthold, 2008 | World Health Survey (CS**) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to-face interviews**) | 18-69 | 19% | Female | 2183** | 50.4 ** | N/S | 17 |
| Sharara, 2013 | Maatoug, 2013 | CS** | Cluster sampling** | Subnation al level (Sousse; Household)** | 2009 | Adults | <150 min/week of moderate level of PA | Oxford Health Alliance Community Interventio n for Health Project | Personal interviews** | Mean: 37.9 | 44.4% | Male and Female | 1880 | ♂<♀** | 73.3 ** | 17 |
| UAE (number of studies = 5) | | | | | | | | | |
| Sisson, Guthold, Sharara, 2008 | Guthold, 2008 | World Health Survey (CS**) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to-face interviews**) | 18-69 | 43.2%*** | Male and Female | 1104 | ♂>♀** | 94.9 ** | 19 |
| Sisson, Guthold, Sharara, 2008 | Guthold, 2008 | World Health Survey (CS**) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to-face interviews**) | 18-69 | 40% | Male | 796*** | 72.1 ** | N/S | 16 |
| Sisson, Guthold, Sharara, 2008 | Guthold, 2008 | World Health Survey (CS**) | MCR S** | National-level | 2002-03 | General population | Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Self-reported (Face-to-face interviews**) | 18-69 | 59% | Female | 308*** | 27.9 ** | N/S | 16 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Female (%) | Responder (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|----------------------------------------------------------|--------------------------|-----------------|-----------------------------------------------|---------|-------------|-------------|---------------|--------------|
| Yammin e, 2016  
Amine, 1996  
Yammin e, 2016  
Sharara, 2018  
Abdul, 2006  
Sharara, 2018  
Sharara, 2018  
Sabri, 2004  
Mabry, 2010  
Mabry, 2010  
Mabry, 2010  
Sharara, 2018  | Amine, 1996  
Amine, 1996  
Amine, 1996  
Abdul, 2006  
McIlvenn y, 2006  
Sharara, 2018  
Sabri, 2004  
Ministry of Health, Kuwait, 2006  
Ministry of Health, Kuwait, 2006  
Ministry of Health, Kuwait, 2006  
Ahmed, 2013  | N/S  
N/S  
N/S  
Case control study**  
Case control study**  
Case control study**  
Ministry of Health, Kuwait, 2006  
Ministry of Health, Kuwait, 2006  
Ministry of Health, Kuwait, 2006  
Kuwait National Nutrition Survey  | RS  
RS  
RS  
S**  
S**  
S**  
RSS  
RSS  
RSS  
N/S  | University students  
University students  
University students  
N/S  
N/S  
N/S  
N/S  
N/S  
N/S  | N/S  
N/S  
N/S  
Subnation al level (N/S)  
Subnation al level (N/S)  
Subnation al level (N/S)  
Subnation al level (N/S)  
Subnation al level (N/S)  
Subnation al level (N/S)  | Nil practice of PA – (Never participated in physical exercises**)  
Mild level of PA- (Mild participation in physical exercises**)  
Less than one hour, <3 times per week  
No regular exercise  
< 1 hour/week of sport  
Mean amount of time spent sitting  
Mean amount of time spent sitting  
Mean amount of time spent sitting  
No deliberate non-work related exercise outside the home such as  
N/S  | Personal physical activity questionnai re  
Personal physical activity questionnai re  
Questionna ire**  
Questionna ire**  
Questionna ire**  
IPAQ  
IPAQ  
IPAQ  
N/S  | Face-to-face interviews with students or their parents**  
Face-to-face interviews with students or their parents**  
Interview**  
Interview**  
Interview**  
20-65  
20-75  
20-65  | 17-24  
17-24  
20-75  
18-94  
20-65  | 48.5%  
47.1%  
39.4%  
54.0%  
47.5%  | Female  
Female  
Male  
Male  
Male  
206  
206  
424  
254  
436  | N/A  
N/A  
Male and Female **  
Male and Female **  
Equ al**  
2280  
912*  
1368*  | 77.6  
72.2  
81.6  
95*  | 19  
19  
20  
10  |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%) | Res- p-rate (%) | QA score (/21) |
|--------------------------|-------------|-------------|-----------------|---------|-------------------------|------------|------------------------------------------------------------|------------------------------------------------------------|--------------------------|-----------------|----------------------------------|---------|-------------|-----------|-------------|---------------|
| Sharara, 2018<sup>8</sup> | Al-Zenki, 2012<sup>31</sup> | Survey<sup>**</sup> | MCR S** | National level (6 PHCC) | 2008-2009 | Adults Kuwaiti | (Neither moderately nor very Active) Lightly active<sup>**</sup> | N/S | Self-reported<sup>**</sup> | 20+ | 57.9% | Male and Female<sup>**</sup> | 1092 | ♂<sup>♂</sup> | N/R | 13 |
| Sharara, 2018<sup>8</sup> | Alarouj, 2013<sup>32</sup> | CS** | RSS* | National level (6 governora tes) | N/S | Kuwaiti nationals | (Neither moderate nor vigorous PA) MPA was considered if participants engaged in physical efforts that cause light sweating or a slight increase in breathing or heart rate; examples of MPA included, brisk walking, painting houses, gardening and climbing stairs<sup>**</sup> | WHO STEPS questionnaire<sup>**</sup> (GPAQ) | Interviews<sup>**</sup> | 20-65 | 63% | Male and Female<sup>**</sup> | 1970 | ♂<sup>♂</sup> | 67<sup>*</sup> | 16 |
| Sharara, 2018<sup>8</sup> | Naser Al- Isa, 2011<sup>33</sup> | CS** | RS** | Subnational level (Universities) | N/S | Kuwaiti college students | Not engaging in regular PA | Questionnaire<sup>**</sup> | Self-reported<sup>**</sup> | N/S | 45.0% | Male and Female<sup>**</sup> | 787 | N/S | N/R | 11 |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2014<sup>34</sup> | CS** | MCR S** | National level | 2014 | Adults | ~600 MET-min/week | GPAQ | Face-to-face interviews<sup>**</sup> | 18-69 | 62.6% | Male and Female<sup>**</sup> | 4391 | ♂<sup>♂</sup> | 89.2<sup>**</sup> | 19 |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2014<sup>35</sup> | CS** | MCR S** | National level | 2014 | Adults | ~600 MET-min/week | GPAQ | Face-to-face interviews<sup>**</sup> | 18-69 | 51.4%<sup>**</sup> | Male | 1429<sup>**</sup> | 37.2<sup>**</sup> | N/S | 16 |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2014<sup>36</sup> | CS** | MCR S** | National level | 2014 | Adults | ~600 MET-min/week | GPAQ | Face-to-face interviews<sup>**</sup> | 18-69 | 72.8%<sup>**</sup> | Female | 2413<sup>**</sup> | 62.8<sup>**</sup> | N/S | 16 |

Oman (number of studies = 2)
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % | Res. rate (%) | QA score (/21) |
|--------------------------|--------------|----------------|---------|--------------------------|------------|-----------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------|---------------------------------|---------|-------------|-----|--------------|-------------|
| Mabry, 2016<sup>7</sup> | El-Aty, 2014<sup>170</sup> | Oman World Health Survey* * | MCR S** | National level** | 2008** | Adults (Omani household* *) | Sedentary (6+ hrs/d) | GPAQ | N/S | 18+ | 23.70% | Male and Female | 3137 | <♀** | 86.3 ** | 18 |
| Mabry, 2016<sup>7</sup> | El-Aty, 2014<sup>170</sup> | Oman World Health Survey* * | MCR S** | National level** | 2008** | Adults (Omani household* *) | Sedentary (6+ hrs/d) | GPAQ | N/S | 18+ | 21.5% | Male | 1459** | 46.5 ** | N/S | 15 |
| Mabry, 2016<sup>7</sup> | El-Aty, 2014<sup>170</sup> | Oman World Health Survey* * | MCR S** | National level** | 2008** | Adults (Omani household* *) | Sedentary (6+ hrs/d) | GPAQ | N/S | 18+ | 25.6% | Female | 1678** | 53.5 ** | N/S | 15 |
| Mabry, 2016<sup>7</sup> | Mabry, 2012<sup>176</sup> | Sur Healthy Lifestyl e Survey Cross-sectional 1** | MCR S** | Sur** | 2006** | Adults (Omani men and non-pregnant women**) | Sedentary (3+ hrs/d) | GPAQ | Face-to-face interviews** | 20+ | 45.30% | Male and Female | 1335 | <♀** | 97.2 ** | 18 |
| Mabry, 2016<sup>7</sup> | Mabry, 2012<sup>176</sup> | Sur Healthy Lifestyl e Survey Cross-sectional 1** | MCR S** | Sur** | 2006** | Adults (Omani men and non-pregnant women**) | Sedentary (3+ hrs/d) | GPAQ | Face-to-face interviews** | 20+ | 64.8% | Male | 591** | 44.3 ** | N/S | 15 |
| Mabry, 2016<sup>7</sup> | Mabry, 2012<sup>176</sup> | Sur Healthy Lifestyl e Survey Cross-sectional 1** | MCR S** | Sur** | 2006** | Adults (Omani men and non-pregnant women**) | Sedentary (3+ hrs/d) | GPAQ | Face-to-face interviews** | 20+ | 37.8% | Female | 744** | 55.7 ** | N/S | 15 |
| Qatar (number of studies = 3) | | | | | | | | | | | | | | | | | | |
| Mabry, 2016<sup>7</sup> | Al Thani, 2015<sup>140</sup> | Qatar STEPwi se survey* * | MCR S** | National level ** | 2012** | Qatari** women | Mean total sitting time (min/d) | GPAQ | Face-to-face interviews** | 18-64 | 183.6 ± 168.3 min/d | Female | 747 | N/A | 88* * | 20 |

Qatar (number of studies = 3)
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Female (% | Males (% | Res- | p-rate (%) | QA score (/21)
|-------------------------|--------------|--------------|----------------|---------|--------------------------|------------|-------------------------------------------------|-------------------------------------------------|--------------------------|----------------|---------------------------------|---------|-------------|-------------|-------------|-------|-------------|-------------|
| Sharara, 2018 | Al-Nakeeb, 2015 | CS** | N/S | Qatar University ** | N/S | Young adults | <840 MET-min/week | Self-report questionnaire** | Face-to-face interviews** | Mean = 21.2 | 50.8 | Male and Female ** | 732 | N/S | N/S | 10 |
| Sharara, 2018 | WHO-STEPS survey, 2012 | CS** | MCR S** | National level | 2012 | Qatari adults** | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18-64 | 45.9 | Male and Female ** | 2442 | n= | 85* | 88* | 20 |
| Sharara, 2018 | WHO-STEPS survey, 2012 | CS** | MCR S** | National level | 2012 | Qatari adults** | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18-64 | 37.4** | Male | 1030** | 42.2 | N/S | 17 |
| Sharara, 2018 | WHO-STEPS survey, 2012 | CS** | MCR S** | National level | 2012 | Qatari adults** | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18-64 | 54.2** | Female | 1412** | 57.8 | N/S | 17 |
| Jordan (number of studies = 6) |
| Sharara, 2018 | Zindah, 2008 | Behavior Risk Factor Surveillance System | MCR S** | National level (Household) | 2004 | Jordanian adults ** | Not engaging in moderate activity (resulting in light sweating, small increases in breathing or heart rate) | Questionnaire** | Interviews** | 18+ | 51.8% | Males and Females** | 710 | N/S | 85.2 | 17 |
| Sharara, 2018 | Centers for Disease Control, Prevention, 2003 | Jordan Behavioral Risk Factor Survey | MCR S** | Subnational level (Household)** | 2002 | Jordanian adults ** | Less than having moderate: activity that caused light sweating and small increases in heart rate or breathing for 30 min | Questionnaire** | Interviews** | 18+ | 47.4 | Male and Female ** | 8791 | N/S | 92* | 18 |
| Sharara, 2018 | Mohanna d, 2008 | CS** | MCR S** | Subnational level (Household)** | 2002 | Jordanian residents** | No activity that caused light sweating and small increases in heart rate or breathing | Questionnaire** | Interviews** | 40+ | 58.7 | Male and Female ** | 3083 | Equal** | 95.8 | 17 |
| Sharara, 2018 | Kulwicki, 2001 | Nonexperimental | Subnational level | N/S | Jordanian residents** | No exercise | Questionnaire** | Interviews** | 17-93 | 22.5% | Male and Female | 209 | N/S | N/S | 11 |
| Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Female (%) | Male and Female (%) | QA score (%/21) |
|--------------|--------------|-----------------|---------|--------------------------|------------|------------------------------------------------|------------------------------------------------|--------------------------|----------------|-----------------------------------------------|---------|--------------|---------------|-----------------|----------------|
| Sharara, 2018 | WHO-Steps survey, 2007 | CS** | MCR S | National level | 2007 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18+ | 5.2 | Male and Female | 3654 | ♀, ♂ | 99.1 | 98* | 19 |
| Sharara, 2018 | WHO-Steps survey, 2007 | CS** | MCR S | National level | 2007 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18+ | 5.8 | Male | 1939 | ♀, ♂ | 53.1 | N/S | 16 |
| Sharara, 2018 | WHO-Steps survey, 2007 | CS** | MCR S | National level | 2007 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18+ | 4.5 | Female | 1715 | ♀, ♂ | 46.9 | N/S | 16 |
| Sharara, 2018 | WHO-Steps survey, 2011-2012 | CS** | MCR S | National level | 2012 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 15-64 | 32.1 | Male and Female | 5300 | N/S | 95* | * | 19 |
| Sharara, 2018 | WHO-Steps survey, 2011-2012 | CS** | MCR S | National level | 2012 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 15-64 | 23.3 | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018 | WHO-Steps survey, 2011-2012 | CS** | MCR S | National level | 2012 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 15-64 | 42.0 | Female | N/S | N/S | N/S | 16 |
| Sharara, 2018 | Abolfotoh, 2007 | N/S | Multistage sampling** | Subnational level (Alexandria)** | 2002-2003 | Students living in university hostels | (No non-VPA for at least 20 min or 3 times per week) No exercise ** | Questionnaire** | Self-reported ** | 17-25 | 33.8 | Male and Female | 600 | N/S | 94* | * | 17 |
| Sharara, 2018 | Kamel, 2013 | CS** | Continuous recruitment* | Subnational level (PHCC)** | 2010-2011 | Elderly people** | Not active** | Questionnaire** | Self-reported ** | 60+ | 63.8 | Male and Female | 340 | N/S | N/S | 12 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population definition or sedentary behavior | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Res. rate (%) | QA score (/21) |
|--------------------------|-------------|--------------|----------------|---------|--------------------------|---------------------------------------------|-------------------------------------------------|--------------------------|----------------|-----------------------------------------------|---------|-------------|---------------|---------------|
| Sharara, 2018⁸           | Mahfouz, 2014⁶ | Case control study** | RS** | Subnation al level (El-Mina oncology centre) ** | 2011 | Cases of colorectal cancer receiving treatment** | No exercise | Questionnaire** | Self-reported ** | <20- >60 | 100% | Male and Female ** | 150 | N/S | N/S | 13 |
| Sharara, 2018⁸           | Mahfouz, 2014⁶ | Case control study** | RS** | Subnation al level (El-Mina oncology centre) ** | 2011 | Age and sex matched controls** | No exercise | Questionnaire** | Self-reported ** | <20- >60 | 78.3% | Male and Female ** | 300 | N/S | N/S | 13 |
| Iraq (number of studies = 1) | | | | | | | | | | | | | | | |
| Sharara, 2018⁸           | WHO- STEPS survey, 2015⁴⁷ | CS** | MCR S** | National level | 2015 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18+ | 47% | Male and Female ** | 4120 | 98.8 | 19 |
| Sharara, 2018⁸           | WHO- STEPS survey, 2015⁴⁷ | CS** | MCR S** | National level | 2015 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18+ | 34.9%** | Male | 1568** | 39.3 | 16 |
| Sharara, 2018⁸           | WHO- STEPS survey, 2015⁴⁷ | CS** | MCR S** | National level | 2015 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 18+ | 60.0%** | Female | 2420** | 60.7 | 16 |
| Libya (number of studies = 1) | | | | | | | | | | | | | | | |
| Sharara, 2018⁸           | WHO- STEPS survey, 2009⁴⁸ | CS** | MCR S** | National level | 2009 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 43.9% | Male and Female ** | 3590 | Equal** | N/S | 16 |
| Sharara, 2018⁸           | WHO- STEPS survey, 2009⁴⁸ | CS** | MCR S** | National level | 2009 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 36.0%** | Male | 1800** | 50.1 | N/S | 16 |
| Sharara, 2018⁸           | WHO- STEPS survey, 2009⁴⁸ | CS** | MCR S** | National level | 2009 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 51.7%** | Female | 1790** | 49.9 | N/S | 16 |
| Lebanon (number of studies = 6) | | | | | | | | | | | | | | | |
| Sharara, 2018⁸           | WHO- STEPS survey, 2009⁴⁸ | CS** | MCR S** | National level | 2008-2009 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 45.8% | Male and Female ** | 1982 | 98.5 | N/S | 16 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | χ²/dfs (%) | Response rate (%) | QA score (/20) |
|--------------------------|-------------|-------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|-----------------------------------------------------------------|---------------------------------|----------------|------------------------------------------------------|--------|-------------|-------------|----------------|---------------|
| Sharara, 2018<sup>9</sup> | WHO-STEPS survey, 2009<sup>9</sup> | CS** | MCR S** | National level | 2008-2009 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 52.2%** | Male | 893** | 45.1 ** | N/S | 16 |
| Sharara, 2018<sup>9</sup> | WHO-STEPS survey, 2009<sup>9</sup> | CS** | MCR S** | National level | 2008-2009 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 40.3%** | Female | 1089** | 54.9 ** | N/S | 16 |
| Sharara, 2018<sup>9</sup> | Al-Tamim, 2008<sup>9</sup> | CS** | Convenience sampling** | Subnational level | 2007 | Adults | Less than 3 days/week | Questionnaire** | Self-reported** | 18+ | 42.7%** | Male and Female ** | 346 | N/S | N/S | 13 |
| Sharara, 2018<sup>9</sup> | Musharqaieh, 2008<sup>9</sup> | CS** | RS** | Subnational level (5 universities) ** | 2001 | University students** | Physical exercise for <0.5 h/week | Questionnaire** | Interviews** | Mean: 21.0 | 73.6% | Male and Female ** | 2013 | N/S | N/S | 14 |
| Sharara, 2018<sup>9</sup> | Tamim, 2003<sup>9</sup> | CS** | RS** | Subnational level (5 universities) ** | 2000-2001 | University students** | <3 hours/week | Questionnaire** | Interviews** | Mean: 21.0 | 64.3% | Male and Female ** | 1964 | N/S | N/S | 16 |
| Sharara, 2018<sup>9</sup> | Farah, 2015<sup>9</sup> | CS** | MCR S** | National level | 2013-2014 | Adult Lebanese residents** | Neither moderate intensity PA for at least 150 min per week or vigorous intensity PA for 75 min at least per week | Questionnaire** | Face-to-face interviews** | 40+ | 76.0 | Male and Female ** | 1515 | N/S | N/S | 16 |
| Sharara, 2018<sup>9</sup> | Tohme, 2005<sup>9</sup> | CS** | MCR S** | National level | 2003-2004 | Adults | Never engaging in any PA | Questionnaire** | Face-to-face interviews** | 30+ | 40.3 | Male and Female ** | 2010 | Equal** | 95* | 9 | 16 |

Palestine (number of studies = 3)

| Sharara, 2018<sup>9</sup> | WHO-STEPS survey, 2010-11<sup>9</sup> | CS** | MCR S | National level | 2010-2011 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 15-64 | 46.5% | Male and Female ** | 6957 | N/S | N/S | 16 |
| Sharara, 2018<sup>9</sup> | WHO-STEPS survey, 2010-11<sup>9</sup> | CS** | MCR S | National level | 2010-2011 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 15-64 | 33.8%** | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018<sup>9</sup> | WHO-STEPS CS** | MCR S | National level | 2010-2011 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 15-64 | 59.2%** | Female | N/S | N/S | N/S | 16 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Res. rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|------------------------------------------------------------|---------------------------------------------------------------|--------------------------|----------------|-----------------------------------------------|---------|-------------|--------------|---------------|
| Sharara, 2018<sup>8</sup> | Abdul-Rahim, 2003<sup>56</sup> | CS**          | N/S             | Subnation al level (Rural and urban Ramallah) | N/S | Adults | Occupation-related sedentary light PA for men AND no exercise for women | Questionnaire | Interviews** | 30-65 | 56.2% | Male and Female ** |         | 936 | N/S           | 7              |
| Sharara, 2018<sup>8</sup> | Abu-Mourad, 2008<sup>37</sup> | CS**          | Multistage RSS*  | Subnation al level (PHCCs, Gaza Strip) ** | 2005 | Patients attending PHCC** | No home exercise or sports | Questionnaire | N/S | 18+ | 78.0% | Male and Female ** | 956       | N/S | N/S           | 13             |
| **Algeria (number of studies = 1)** | | | | | | | | | | | | | | | | |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2003<sup>58</sup> | CS**          | MCR S** | Subnation al level | 2003 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 40.7% | Male and Female ** | 4102 | N/S | 16            | |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2003<sup>58</sup> | CS**          | MCR S** | Subnation al level | 2003 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 32.5%** | Male | N/S | 39* | N/S           | 16             |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2003<sup>58</sup> | CS**          | MCR S** | Subnation al level | 2003 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 45.8%** | Female | N/S | 61* | N/S           | 16             |
| **Sudan (number of studies = 1)** | | | | | | | | | | | | | | | | |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2005-2006<sup>59</sup> | CS**          | MCR S** | Subnation al level | 2005-2006 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 86.8% | Male and Female ** | 1573 | N/S | 98.3 ** | 19            |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2005-2006<sup>59</sup> | CS**          | MCR S** | Subnation al level | 2005-2006 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 75.9%** | Male | 652** | 41.4 ** | N/S           | 16             |
| Sharara, 2018<sup>8</sup> | WHO- STEPS survey, 2005-2006<sup>59</sup> | CS**          | MCR S** | Subnation al level | 2005-2006 | Adults | <600 MET-min/week | GPAQ | Face-to-face interviews** | 25-64 | 94.8%** | Female | 921** | 58.6 ** | N/S           | 16             |
### Systematic review

| Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Sample size (♀/♂(%)) | Responder rate (%) | QA score (/21) |
|--------------|--------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|----------------------------------------------------------------|----------------------------|-----------------|-----------------------------------------------|--------|--------------|-----------------------|-----------------|-----------|
| **Morocco (number of studies = 3)**

| Sharara, 2018     | El Rhazi, 2011 | CS** MCR S**    | National level | 2008 | Adults | Less than 30 min of regular, moderate or intense PA on most days** | Questionnaire** | Face-to-face interviews** | 18+ | 38.7% (n= 1014) | Male and Female ** | 2620 | Equal** | N/S | 16 |
| Sharara, 2018     | El Rhazi, 2011 | CS** MCR S**    | National level | 2008 | Adults | Less than 30 min of regular, moderate or intense PA on most days** | Questionnaire** | Face-to-face interviews | 18+ | 32.4% (n= 441) | Male | 1359 | 51.9 ** | N/S | 16 |
| Sharara, 2018     | El Rhazi, 2011 | CS** MCR S**    | National level | 2008 | Adults | Less than 30 min of regular, moderate or intense PA on most days** | Questionnaire** | Face-to-face interviews** | 18+ | 45.4% (n= 573) | Female | 1261 | 48.1 ** | N/S | 16 |

| **Bahrain (number of studies = 1)**

| Sharara, 2018     | Hamadeh, 2000 | CS** RCS* **    | Subnational level (household)** | N/S | Bahraini residents** | No exercise | Questionnaire** | Interviews** | 30-79 | 89.1% | Male and Female | 516 | N/S | 99.2 ** | 14 |

| **Syria (number of studies = 1)**

| Sharara, 2018     | Al Ali, 2011   | 2nd Aleppo Household Survey | Two-stage cluster sampling** | Subnational level | 2006 | Adults | Less than 15 min/week of sport or brisk walking | Questionnaire** | Interviews** | 25+ | 82.3% | Male and Female ** | 1168 | N/S | N/S | 14 |

### Notes:

All non-reported data was searched and extracted from the original study. Any additional information found relevant in the original study was added to the reported data for the purpose of completeness.

If not reported, the prevalence of the outcome among the total study population (males and/or females) was calculated using row or calculated data available in the original study. The calculated prevalence measure was reported and marked using two stars (**).

If not reported, the total sample size for each gender strata was calculated based on the percentage of males or females in the sample.

If not reported, the number for cases in each gender strata was calculated based on the reported prevalence and the total sample size in the strata.

If not reported, the total number for cases in the entire sample was calculated by the addition of the number of cases in each reported stratum.

For not reported mean time measures on the total study population, the overall males and females weighted mean time was calculated using mean time and the proportion of males and females in the sample, respectively.

If any discordance between the reported data in the SR and data available in the original study, this later was retained.
Extra studies are studies included in a SR and reporting one or more PA related outcome on MENA countries that were not reported in the SR (outcome or country not included in the SR). Extra data from these studies was extracted and used for the qualitative and quantitative synthesis. Converted data from physical inactivity to PA was used only for the quantitative synthesis and was not reported in the above tables.

Abbreviations: SR: Systematic review; PA: Physical activity; VPA: Vigorous physical activity; MPA: Moderate physical activity; KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates; USA: United States of America; GCC: Gulf cooperation council; MENA: Middle-East and North Africa; QA: Quality assessment; ATLS: Arab teens lifestyle student questionnaire; GPAQ: Global Physical Activity Questionnaire; IPAQ: International Physical Activity Questionnaire; CS: Cross sectional; MCRS: Multistage stratified/cluster random sampling; PHCC: Primary Health Care Centre; RS: Random sampling; RCS: Random cluster sampling; RSS: Random stratified sampling; MET: Metabolic Equivalent of Task; VG: Video games; Resp-rate: response rate; N/S: Not stated; N/A: Not applicable; † The use of a validated questionnaire was not reported in the original study. ‡ The use of Nurses’ Health Study II questionnaire was not reported in the original study. * Calculated from reported data in the SR **Calculated or reported from data in the original study ***Calculated from the prevalence measure reported in the original study (different from the prevalence measure reported in the SR)

♂: Males; ♀: Females; km: Kilometer; min: Minutes; wk: Week; d: Day; d-1: Per day; hrs: hours; h: hour

MJ: The megajoule is equal to one million (106) joules; Energy expenditure of >0.3 MJ/day is equivalent to walking daily for half an hour at 5 km/h.
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % (rate) | Resp-score (/21) |
|-------------------------|-------------|-------------|----------------|---------|-------------------------|------------|----------------------------------------------------------|--------------------------|-----------------|------------------------------------------------------|--------|-------------|-----------|------------------|
| Saudi Arabia (number of studies = 28) | | | | | | | | |
| Mabry, 2016 | Al-Hazzaa, 2011 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Saudi** secondary-school students | Computer/TV time >2 hrs/d | ATLS | Self-administrate d** | 14-19 | 87.7%** | Male and Female* | 2908 | Equal** | N/S | 15 |
| Mabry, 2016 | Al-Hazzaa, 2011 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Saudi** secondary-school students | Computer/TV time >2 hrs/d | ATLS | Self-administrate d** | 14-19 | 84.0% | Male | 1401* * | 48.2** | N/S | 15 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Saudi** secondary-school students | Computer/TV time >2 hrs/d | ATLS | Self-administrate d** | 14-19 | 91.2% | Female | 1507* * | 51.8** | N/S | 15 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Saudi** school students | Computer/TV time >3 hrs/d | ATLS | Self-administrate d** | 15-19 | 76.0%** | Male and Female | 1373* * | 48.7** | N/S | 15 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Saudi** school students | Computer/TV time >3 hrs/d | ATLS | Self-administrate d** | 15-19 | 69.8% | Male | 1373* * | 48.7** | N/S | 15 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Saudi** school students | Computer/TV time >3 hrs/d | ATLS | Self-administrate d** | 15-19 | 81.8% | Female | 1449* * | 51.3** | N/S | 15 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar and Riyadh ** | N/S | Saudi** school students | Mean computer/TV time (hrs/d) | ATLS | N/S | | 14-18 | 5.6h** | Male and Female* | 1648 | Equal** | N/S | 13 |
| Mabry, 2016 | Al-Hazzaa, 2013 | Population-based survey (CS**) | MCRS** | Al-Khobar and Riyadh ** | N/S | Saudi** school students | Mean computer/TV time (hrs/d) | ATLS | N/S | | 14-18 | 5.31 ± 3.1 hrs/d | Male | 797** | 48.4** | N/S | 13 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | QE (%) | Res p - rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|------------------------------------------------|------------------------------------------------|--------------------------|----------------|------------------------------------------------|---------|-------------|---------|----------------|-------------|
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2013<sup>145</sup> | Population-based survey (CS**) | MCRS** Al-Khobar and Riyadh ** | N/S | Saudi** school students | Mean computer/TV time (hrs/d) | ATLS | N/S | 14-18 | 5.89 ± 3.3 hrs/d | Female | 851** | 51.6** | N/S | 13 |
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2013<sup>145</sup> | Population-based survey (CS**) | MCRS** Al-Khobar and Riyadh ** | N/S | Saudi** school students | Computer/TV time >2 hrs/d | ATLS | N/S | 14-18 | 87.9 % | Male and Female | 1648 | Equal* | N/S | 12 |
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2013<sup>145</sup> | Population-based survey (CS**) | MCRS** Al-Khobar and Riyadh ** | N/S | Saudi** school students | Computer/TV time >2 hrs/d | ATLS | N/S | 14-18 | 84.2 % | Male | 797** | 48.4** | N/S | 12 |
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2013<sup>145</sup> | Population-based survey (CS**) | MCRS** Al-Khobar and Riyadh ** | N/S | Saudi** school students | Computer/TV time >2 hrs/d | ATLS | N/S | 14-18 | 91.6 % | Female | 851** | 51.6** | N/S | 12 |
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2007<sup>144</sup> | Population-based survey (CS**) | MCRS** Jeddah** 2006** | Saudi ** preschool children | Mean computer/TV time (min/d) | Questionnaire to parents** | Self-administrate d** | 3.4-6.4 | 154.8 ± 66.1 min/d | Male and Female | 224 | Equal* | 75* | 17 |
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2007<sup>144</sup> | Population-based survey (CS**) | MCRS** Jeddah** 2006** | Saudi ** preschool children | Mean computer/TV time (min/d) | Questionnaire to parents** | Self-administrate d** | 3.4-6.4 | 162.4 ± 69.9 min/d | Male | 109** | 48.7** | N/S | 15 |
| Mabry, 2016<sup>7</sup>   | Al-Hazzaa, 2007<sup>144</sup> | Population-based survey (CS**) | MCRS** Jeddah** 2006** | Saudi ** preschool children | Mean computer/TV time (min/d) | Questionnaire to parents** | Self-administrate d** | 3.4-6.4 | 147.7 ± 61.7 min/d | Female | 115** | 51.3** | N/S | 15 |
| Mabry, 2016<sup>7</sup>   | Al-Nakeeb, 2012<sup>146</sup> | Population-based survey | RSS** Al-Ahsa** | N/S | School students | Mean time watching TV (hrs/d) | ATLS | Self-administrate d** | 15-17 | 2.56** hrs/d | Male and Female* | 2290 (UK+ KSA) | Equal* | N/S | 12 |
| Mabry, 2016<sup>7</sup>   | Al-Nakeeb, 2012<sup>146</sup> | Population-based survey | RSS** Al-Ahsa** | N/S | School students | Mean time watching TV (hrs/d) | ATLS | Self-administrate d** | 15-17 | 2.51 hrs/d (±1.81**) | Male | 576** | 52.0** | N/S | 12 |
| Mabry, 2016<sup>7</sup>   | Al-Nakeeb, 2012<sup>146</sup> | Population-based survey | RSS** Al-Ahsa** | N/S | School students | Mean time watching TV (hrs/d) | ATLS | Self-administrate d** | 15-17 | 2.61 hrs/d (±1.91**) | Female | 531** | 48.0** | N/S | 12 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measuremen | Gender | Sample size | % (res) | Res p - rate (%) | QA score (/21) |
|--------------------------|-------------|-------------|-----------------|---------|-------------------------|------------|-------------------------------------------------|-------------------------------------------------|------------------------|-----------------|---------------------------------|--------|------------|---------|---------------|--------------|
| Mabry, 2016⁷ | Al-Nakeeb, 2012 ¹⁴⁶ | Population-based survey | RSS** | Al-Ahsa** | N/S | School students | Mean computer time (hrs/d) | ATLS | Self-administrate d** | 15-17 | 2.83 hrs/d ** | Male and Female* | 2290 (UK+ KSA) 1107 (from KSA) ** | Equal* ** | N/S | 12 |
| Mabry, 2016⁷ | Al-Nakeeb, 2012 ¹⁴⁶ | Population-based survey | RSS** | Al-Ahsa** | N/S | School students | Mean computer time (hrs/d) | ATLS | Self-administrate d** | 15-17 | 2.41 hrs/d (2.48±2.0 7 hrs/d **) | Male | 576** | 52.0** | N/S | 12 |
| Mabry, 2016⁷ | Al-Nakeeb, 2012 ¹⁴⁶ | Population-based survey | RSS** | Al-Ahsa** | N/S | School students | Mean computer time (hrs/d) | ATLS | Self-administrate d** | 15-17 | 3.18 hrs/d (±2.07**) | Female | 531** | 48.0** | N/S | 12 |
| Mabry, 2016⁷ | Al-Nuaim, 2012 ¹⁴⁷ | Population-based survey (CS**) | RS** | Al-Ahsa** | N/S | Secondary ** school students | Mean time watching TV (hrs/d) | ATLS | Self-administrate d** | 15-19 | 2.54 hrs/d ** | Male and Female* | 1270 | Equal* * | N/S | 12 |
| Mabry, 2016⁷ | Al-Nuaim, 2012 ¹⁴⁷ | Population-based survey (CS**) | RS** | Al-Ahsa** | N/S | Secondary ** school students | Mean time watching TV (hrs/d) | ATLS | Self-administrate d** | 15-19 | 2.49 hrs/d (±1.80**) | Male | 663** | 52.2** | N/S | 12 |
| Mabry, 2016⁷ | Al-Nuaim, 2012 ¹⁴⁷ | Population-based survey (CS**) | RS** | Al-Ahsa** | N/S | Secondary ** school students | Mean time watching TV (hrs/d) | ATLS | Self-administrate d** | 15-19 | 2.60 hrs/d (±1.90**) | Female | 607** | 47.8** | N/S | 12 |
| Mabry, 2016⁷ | Al-Nuaim, 2012 ¹⁴⁷ | Population-based survey (CS**) | RS** | Al-Ahsa** | N/S | Secondary ** school students | Mean computer time (hrs/d) | ATLS | Self-administrate d** | 15-19 | 2.81 hrs/d ** | Male and Female* | 1270 | Equal* * | N/S | 12 |
| Mabry, 2016⁷ | Al-Nuaim, 2012 ¹⁴⁷ | Population-based survey (CS**) | RS** | Al-Ahsa** | N/S | Secondary ** school students | Mean computer time (hrs/d) | ATLS | Self-administrate d** | 15-19 | 2.43 hrs/d (±2.07**) | Male | 663** | 52.2** | N/S | 12 |
| Mabry, 2016⁷ | Al-Nuaim, 2012 ¹⁴⁷ | Population-based survey (CS**) | RS** | Al-Ahsa** | N/S | Secondary ** school students | Mean computer time (hrs/d) | ATLS | Self-administrate d** | 15-19 | 3.19 hrs/d (±2.40**) | Female | 607** | 47.8** | N/S | 12 |
| Mabry, 2016⁷ | Farghaly, 2007 ¹⁷⁷ | Population-based survey (CS**) | Two-stage RS** | Abha** | 2000** | Saudi** Students | Mean TV time (hrs/d) | Designed questionnaire | Self-reported by students or parents** | 7-20 | 1.0± 1.0 hrs/d | Male and Female | 767 | ♂ <♀ * | N/S | 15 |

**CS** = cross-sectional study, **RSS** = randomised sampliing survey, **ATLS** = adapted teacher-led self-administered survey.
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measuremen | Gender | Sample size | Reporting rate (%) | QA score (/21) |
|--------------------------|-------------|-------------|----------------|---------|--------------------------|------------|-----------------------------------------------------------|---------------------------------------------------------------|-----------------------------|-----------------|-----------------------------------------------|---------|------------|-----------------|---------------|
| Mabry, Farghaly, 2016    | Mabry, Mahfouz, 2016 | Population-based survey (CS**) | Two-stage RS** | Abha** | 2000** | Saudi** Students | Mean computer game time (hrs/d) | Designed questionnaire** | Self-reported by students or parents** | 7-20 | 0.7 ± 0.9 hrs/d | Male and Female | 767 | >10% <20% | N/S | 15 |
| Mahfouz, 2011          | Mahfouz, 2016 | Population-based survey (CS**) | RSS** | Abha and Ahad Rufeida** | 2008** | Adolescents (School students*) | Watched > 3hrs TV/d | CDC Adolescent Health adapted questionnaire (Validated Arabic version**) | Face-to-face interviews** | 11-19 | 42.9%** | Male and Female* | 1869 | >10% <20% | N/S | 13 |
| Mahfouz, 2011          | Mahfouz, 2016 | Population-based survey (CS**) | RSS** | Abha and Ahad Rufeida** | 2008** | Adolescents (School students*) | Watched > 3hrs TV/d | CDC Adolescent Health adapted questionnaire (Validated Arabic version**) | Face-to-face interviews** | 11-19 | 38.0% | Male | 1249* | >10% <20% | 96.7** | 16 |
| Mahfouz, 2016          | Mahfouz, 2016 | Population-based survey (CS**) | RSS** | Abha and Ahad Rufeida** | 2008** | Adolescents (School students*) | Watched > 3hrs TV/d | CDC Adolescent Health adapted questionnaire (Validated Arabic version**) | Face-to-face interviews** | 11-19 | 52.7% | Female | 620** | >10% <20% | 97.1** | 16 |
| Mahfouz, 2016          | Mahfouz, 2016 | Population-based survey | RSS** | Abha** | 2005** | Adolescents school boys | Watched > 3hrs TV/d | Arabic version of CDC Adolescent Health Survey | Face-to-face interviews** | 11-19 | 38.0% | Male | 2696 | N/A | 96.7 for intermediate schools 97.1 for secondary schools | 16 |
| Study source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurem ent | Gender | Sampl e size | Res p - rate (%) | QA score (/21) |
|-------------|-------------|------------------|---------|--------------------------|-------------|-----------------------------------------------------|------------------------------------------------------------|--------------------------|-----------------|----------------------------------|--------|-------------|----------------|-------------|
| Mabry, 2016\(^7\) | Musaiger, 2013 \(^78\) | Population-based survey (CS**) | Jeddah** | 2005-06** | Girl school students | \(\geq 3\) hrs TV time/d | Validated questionnaire on the frequency of intake of certain food items and lifestyle** | N/S | 12-19 | 60.9 % | Female | 512 | N/A | N/S | 13 |
| Sharara, 2018\(^9\) | Al-Hazzaa, 2011 \(^123\) | Arab Teens Lifestyle Study: CS | Subnation al level (three major cities in Saudi Arabia)** | 2009-2010 | Students* | \(<1680\) METs/min/week | ATLS | Self-reported** | 15-19 | 61.9% | Male and Female* * | 2908 | N/S | N/S | 16 |
| Sharara, 2018\(^9\) | AlBuhairan, 2015 \(^88\) | School-based national CS study** | Stratified Cluster RS** | National level (278 Schools)** | Students from intermediate and secondary schools** | Complete absence of exercise | YRBSS and the GSHS Questionnaires | Self-administered | Mean: 15.8 | 45.2% | Male and Female* * | 12575 | Equal* * | 32.7 ** | 12 |
| Sharara, 2018\(^9\) | Al-Muhaimmed, 2015 \(^69\) | CS** | Multistage RS** | Subnation al level (primary schools)** | 2012 | Students in grade 1-4*** | Not engaging in sports | Questionnaire** | Reported by parents** | 6-10 | 27.3% | Male and Female* * | 601 | N/S | N/S | 13 |
| Sharara, 2018\(^9\) | Al-Mutaiiir, 2015 \(^86\) | CS** | RS** | Subnation al level (4 Schools)** | 2013 | Adolescents from secondary schools** | No regular exercise | Questionnaire** | N/S | 15-22 | 31.9% | Male and Female* * | 426 | Equal* * | N/S | 13 |
| Sharara, 2018\(^9\) | Al-Othman, 2012 \(^91\) | CS** | N/S | Subnation al level (4 PHCCs)** | 2010 | Children and adolescent s** | Based on weekly frequency: Never | Questionnaire** | Self-reported** | 6-17 | 15.7% | Male and Female* * | 331 | Equal* * | N/S | 11 |
| Sharara, 2018\(^9\) | Mahfouz, 2011 \(^92\) | CS** | RSS** | Subnation al level | 2008 | Students from 1st, less than 30 min of | CDC Adolescent Interviews** | 11-19 | 34.3% | Male and | 1869 | Equal* * | 97* * | 18 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | %/ (%) | Response rate (%) | QA score (/21) |
|--------------------------|-------------|--------------|----------------|---------|------------------------|------------|---------------------------------------------------------|----------------------------------------------------------------------------|----------------------------|----------------|-----------------------------------------------|---------|-------------|-------|----------------|----------------|
| Al-Hazzaa, 2018<sup>8</sup> | Al-Hazzaa, 2011<sup>124</sup> | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Adolescents ** | <1680 METs-min per week | ATLS | Self-administrated ** | N/S | 61.3% | Male and Female* | 2908 | Equal ** | N/S | 16 |
| Al-Hazzaa, 2018<sup>8</sup> | Al-Hazzaa, 2011<sup>124</sup> | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Adolescents ** | <1680 METs-min per week | ATLS | Self-administrated ** | 16.7±1.1 | 44.5% | Male | 1401 | 48.2** | N/S | 16 |
| Al-Hazzaa, 2018<sup>8</sup> | Al-Hazzaa, 2011<sup>124</sup> | Population-based survey (CS**) | MCRS** | Al-Khobar, Jeddah and Riyadh ** | 2009-10** | Adolescents ** | <1680 METs-min per week | ATLS | Self-administrated ** | 16.5±1.1 | 78.1% | Female | 1507 | 51.8** | N/S | 16 |
| Al-Hazzaa 2018<sup>8</sup> | Al-Hazzaa, 2007<sup>125</sup> | CS** | RS** | Jeddah | Apr and May 2006** | Preschoolers | <10000 step counts per day | Electronic pedometer | Objective measurement ** | 5.2±0.8 | 77.2%** | Male and Female | 224 | *<ψ | 75%* | 20 |
| Al-Hazzaa 2018<sup>8</sup> | Al-Hazzaa, 2007<sup>125</sup> | CS** | RS** | Jeddah | Apr and May 2006** | Preschoolers | <10000 step counts per day | Electronic pedometer | Objective measurement ** | 5.2±0.8 | 72.9% | Male | 109 | 48.6 | N/S | 18 |
| Al-Hazzaa 2018<sup>8</sup> | Al-Hazzaa, 2007<sup>125</sup> | CS** | RS** | Jeddah | Apr and May 2006** | Preschoolers | <10000 step counts per day | Electronic pedometer | Objective measurement ** | 5.2±0.8 | 81.4% | Female | 115 | 51.4 | N/S | 18 |
| Al-Hazzaa 2018<sup>8</sup> | Al-Hazzaa, 1993<sup>126</sup> | N/S | N/S | Riyadh | N/S | School children | Daily heart rate <159 bpm for at least 20 min/day | Continuous heart rate monitoring | Objective measurement ** | 9.5±1.4 | 85% | Male | 212 | N/A | 68.7%** | 13 |
| Al-Hazzaa, 2018<sup>8</sup> | Al-Hazzaa, 2002<sup>127</sup> | N/S | N/S | Riyadh | N/S | School children | Daily heart rate <140 bpm for at least 30 min/day | Continuous heart rate monitoring | Objective measurement ** | 9.6±1.5 | 57.1% | Male | 92 | N/A | N/S | 11 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%) | Repeat rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|-------------------------------------------------|-------------------------------------------------|-----------------------------|----------------|---------------------------------|---------|-------------|-----------|----------------|--------|
| Al-Hazzaa, 2018<sup>8</sup> | Al-Hazzaa, 2007<sup>128</sup> | N/S           | RS**            | Riyadh  | N/S                      | School children | <13000 step counts | Electronic pedometer | Objective measurement** | 10.3+-1.3 | 47.1% | Male   | 296       | N/A             | N/S       | 14   |
| Al-Hazzaa, 2018<sup>9</sup> | Al-Kutbe, 2017<sup>129</sup> | CS**          | N/S             | Makkah  | Jan-May 2014**           | School children | <10000 step counts/ day | Accelerometer | Objective measurement** | 8-11 | Low 6757 step/day (20.2 min/day of MVPA) | Female | 78         | N/A             | 65.3 %* | 16   |
| Al-Hazzaa, 2018<sup>9</sup> | Al-Rukban, 2003<sup>130</sup> | CS**          | MCRS            | Riyadh  | Septemb er 2001-January 2002 ** | Intermediate and secondary school students ** | <30 min for <4 days/ week | Questionnaire Internally validated** | Self-administered ** | 15.7+-1.8 | 72.3% | Male   | 894       | N/A             | N/S       | 15   |
| Al-Hazzaa, 2018<sup>9</sup> | Taha, 2008<sup>131</sup> | CS**          | Multistage stratified self-weighting sampling ** | Al-Khobar | 2001-2002** | School students* ** | Any bodily movement produced by skeletal muscles that resulted in energy expenditure above the basal level for at least 20 minutes per session** <3 times/ week | Questionnaire | Self-reported** | 16.3+-1.7 | 60.3%** | Male and female | 2571 | ♂<♀ | N/S             | 12      |
| Al-Hazzaa, 2018<sup>9</sup> | Taha, 2008<sup>131</sup> | CS**          | Multistage stratified self-weighting sampling ** | Al-Khobar | 2001-2002** | Adolescents | Any bodily movement produced by skeletal muscles that resulted in energy expenditure above the basal level for at least 20 minutes | Questionnaire | Self-reported** | 16.3+-1.7 | 54.4% | Male   | 1240      | 48.2           | 84.1 - 100% | 15   |
| Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % | QA score (/21) |
|--------------|--------------|-----------------|---------|-------------------------|------------|-----------------------------------------------------------|---------------------------|------------------|------------------------------------------------------|--------|-------------|----|----------------|
| Al-Hazzaa, Taha, 2008 | CS** | Multistage stratified self-weighting sampling ** | Al-Khobar | 2001-2002** | Adolescents | Any bodily movement produced by skeletal muscles that resulted in energy expenditure above the basal level for at least 20 minutes per session** <3 times/week | Questionnaire | Self-reported** | 16.3-1.7 | 66.3% | Female | 1331 | 51.8 | 89.6-100% | 15 |
| Al-Hazzaa, Mahfouz, 2012 | CS** | MCRS** | Aseer | N/S | Adolescents (students* *) | <30 min of PA in previous week | Validated CDC Adolescent Health survey** Questionnaire | Face-to-face interviews** | 12-19** | 31.4%** | Male and female | 1869 | 66.8 | 96.7 ** | 16 |
| Al-Hazzaa, Mahfouz, 2012 | CS** | MCRS** | Aseer | N/S | Adolescents (students* *) | <30 min of PA in previous week | Validated CDC Adolescent Health survey** Questionnaire | Face-to-face interviews** | 17.2-1.2 | 25.7% | Male | 1249 | 33.2 | 97.1 ** | 16 |
| Al-Hazzaa, Mahfouz, 2012 | CS** | MCRS** | Aseer | N/S | Adolescents (students* *) | <30 min of PA in previous week | Validated CDC Adolescent Health survey** Questionnaire | Face-to-face interviews** | 12-19 | 42.9% | Female | 620 | 33.2 | 97.1 ** | 16 |
| Al-Hazzaa, Alzahrani, 2014 | Health Behaviour in School-aged | MCRS** | Riyadh | N/S | Adolescents | <60 min, 5 day/week | Questionnaire validated in Arabic | Self-administered ** | 13,14, 17-18 | 63.7% | Male | 1335 | N/A | 100% | 16 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | F/M (%) | Response rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|---------------------------|-----------------|-----------------------------------------------|--------|--------------|-----------|----------------|--------------|
| Al-Hazzaa, 2018<sup>8</sup> | Alsubaie, 2015<sup>134</sup> | CS** | MCRS** | Riyadh | N/S | Adolescents | Moderate to vigorous PA for 60 min/day ** <5 days a week | Standard ** 30-day recall questionnaire | Self-administered ** | 15-18 | 20.1% | Male | 453 | N/A | N/S | 12 |
| Al-Hazzaa, 2018<sup>8</sup> | Bajamal, 2017<sup>135</sup> | CS** | SRS** | Jeddah | Jan-Mar 2016** | Adolescents | Sum of moderate to vigorous activity score during the past 7 days** | PAQ-A | Self-administered ** | 13-18 | low | Female | 405 | N/A | 98.8%** | 20 |
| Al-Hazzaa, 2018<sup>8</sup> | Al-Raddadi, 2018<sup>136</sup> | CS** | RS** | Jeddah | N/S | Adolescents | <150 mins per week | Questionnaire | Self-administered ** | 17.2+/-1.2 | 86.1% | Female | 410 | N/A | N/S | 12 |
| Al-Hazzaa, 2018<sup>8</sup> | El Bcheraoui, 2013<sup>84</sup> | Multistage survey** | RS** | National Sample | 2013 | Adolescents | <420 MET-min/week | IPAQ | Self-reported ** | 15-17 | 55.71%** | Male and Female | Unclear | N/A | 89.4%* | 20 |

**UAE (number of studies = 6)**

| Yammine, 2016<sup>6</sup> | Wasfi, 2008<sup>16</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Nil practice of PA- (Did not practice physical activity at all**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 21.2%** | Male and Female | 1475 | ♂>♀ | 98.3%** | 18 |
| Yammine, 2016<sup>6</sup> | Wasfi, 2008<sup>16</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Nil practice of PA- (Did not practice physical activity at all**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 10.7% | Male | 835 | 56.6%** | N/S | 15 |
| Yammine, 2016<sup>6</sup> | Wasfi, 2008<sup>16</sup> | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Nil practice of PA- (Did not practice physical activity at all**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 35.0% | Female | 640 | 43.4%** | N/S | 15 |
| Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Gender (%) | Response rate (%) | QA score (/21) |
|--------------|--------------|------------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------|-----------------|----------------------------------------------------------|--------|-------------|-------------|----------------------|--------------|
| Yammine, 2016 | Mehairi, 2013 | CS** | RS | Al Ain** | 2010 | School students | Mild level of PA – (Low score of PA**) | IPAQ short version | 12-18 | 34.4 % ** | Male and Female | 1018* | Equal | 68.3 ** | 16 |
| Yammine, 2016 | Mehairi, 2013 | CS** | RS | Al Ain** | 2010 | School students | Mild level of PA – (Low score of PA**) | IPAQ short version | 12-18 | 24.1 % | Male | 522 | 51.6** | N/S | 14 |
| Yammine, 2016 | Mehairi, 2013 | CS** | RS | Al Ain** | 2010 | School students | Mild level of PA – (Low score of PA**) | IPAQ short version | 12-18 | 45.1 % | Female | 496 | 48.4** | N/S | 14 |
| Yammine, 2016 | Muhairi, 2013 | CS** | RS | Al Ain** | 2010 | School students | Mild level of PA – (Low score of PA**) | IPAQ short version | 15-18 | 36.5 % | Male and Female | 315 | Equal | N/S | 14 |
| Yammine, 2016 | Wasfi, 2008 | Survey** | RSS** | Bur Dubai and Deira** | 2004 | Secondary school students | Mild level of PA – (No vigorous activity or irregularly practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**) | Personal PA questionnaire | 14-18 | 48.8 %* | Male and Female | 1475* | >♀ | N/S | 15 |
| Yammine, 2016 | Wasfi, 2008 | Survey** | RSS** | Bur Dubai and Deira** | 2004 | Secondary school students | Mild level of PA – (No vigorous activity or irregularly practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**) | Personal PA questionnaire | 14-18 | 51.6 % | Male | 835 | 56.6** | N/S | 15 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Res. rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|----------------|---------|--------------------------|------------|------------------------------------------------|-------------------------------------------------|------------------------|-----------------|---------------------------------|---------|-------------|----------------|----------------|
| Yammine, 2016 | Wasfi, 2008 & 16 | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Secondary school students | Mild level of PA – (No vigorous activity or irregularly practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 45.2 % | Female | 640 | 43.4** | N/S | 15 |
| Yammine, 2016 | Wasfi, 2008 & 16 | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Emirati secondary school students | Nil PA practice – (Did not practice PA at all**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 18.9 % | Male and Female | 233 | Unclear | N/S | 16 |
| Yammine, 2016 | Wasfi, 2008 & 16 | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Emirati secondary school students residing in UAE | Mild level of PA – (No vigorous activity or irregularly practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 34.3 % | Male and Female | 233 | Unclear | N/S | 16 |
| Yammine, 2016 | Wasfi, 2008 & 16 | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Non-Emirati secondary school students residing in UAE | Nil PA practice – (Did not practice physical activity at all**) | Personal PA questionnaire | Self-administrate d** | 14-18 | 34.3 % | Male and Female | 1242 | Unclear | N/S | 16 |
| Yammine, 2016 | Wasfi, 2008 & 16 | Survey** | RSS** | Bur Dubai and Deira** | 2004** | Non-Emirati secondary school students | Mild level of PA - (No vigorous activity or irregularly) | Personal PA questionnaire | Self-administrate d** | 14-18 | 51.5 % | Male and Female | 1242 | Unclear | N/S | 16 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%) | Res p - rate (%) | QA score (/21) |
|--------------------------|-------------|----------------|---------|--------------------------|-------------|----------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------|------------------------------------------------|--------|---------------|----------------|----------------|---------------|
| Mabry, 2016 [7]          | Population-based survey | MCRS** Al-Ain** 2007-08** | Public** schools' children (UAE-native **) | % TV viewing/Vide o games > 2 hrs/d | Questions related to TV viewing/V G use time** | Self-administrate d** | 6-10 | 62.9 % (for less than 2h TV**) | Male and Female | 197 | ♂>♀* | 93.4 ** | 17 |
| Mabry, 2016 [7]          | Population-based survey | MCRS** Al-Ain** 2007-08** | Public** schools' children (UAE-native **) | % TV viewing/Vide o games > 2 hrs/d | Questions related to TV viewing/V G use time** | Self-administrate d** | 6-10 | 38.5 %** | Male | 130** | 66** | N/S | 14 |
| Mabry, 2016 [7]          | Population-based survey | MCRS** Al-Ain** 2007-08** | Public** schools' children (UAE-native **) | % TV viewing/Vide o games > 2 hrs/d | Questions related to TV viewing/V G use time** | Self-administrate d** | 6-10 | 34.3 %** | Female | 67** | 34** | N/S | 14 |
| Yammine, 2016 [6]        | GSHS** Two-stage RS National level 2005 Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 14.0 (mean ) | 42 % | Male and Female* | 9916* | Equal | 88.3 % | 16 |
| Yammine, 2016 [6]        | GSHS** Two-stage RS National level 2005 Schoolchildren | % sitting and watching TV, computer | Validated PACE+ and Adolescent | Self-administrate d | 14.0 (mean ) | 41 % | Male | 4849 | 48.9% | N/S | 13 |

*Residing in UAE practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**

**Population-based survey

MCRS**: Multiple Community Randomized Study

Al-Ain**: Al-Ain city

Public**: Public schools

Self-administrate d**: Self-administrate d

Validated**: Validated

Equal**: Equal
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | $$$ | Res p- rate (%) | QA score (/21) |
|--------------------------|-------------|-------------|-----------------|---------|-------------------------|-----------------------------|-------------------------------|--------------------------|-----------------|-------------------------------|---------|------------|------|-------------|-----------|
| Yammine, 2016¹ | Guthold, 2010 $¹⁰$ | GSHS** | Two-stage RS | National level | 2005 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.0 (mean) | 43 % | Female | 5067 | 51.1% | N/S | 13 |
| Sharara, 2018⁹ | GSHS, 2010⁹⁴ | School-based survey | Two stage cluster sample* | National level | 2010 | Students in grade 8,9 and 10** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-report on answer sheet** | 13-15 | 72.5% | Male and Female* | 2038 | N/S | 91* | 19 |
| Sharara, 2018⁹ | GSHS, 2010⁹⁴ | School-based survey | Two stage cluster sample* | National level | 2010 | Students in grade 8,9 and 10** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-report on answer sheet** | 13-15 | 65.5%** | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018⁹ | GSHS, 2010⁹⁴ | School-based survey | Two stage cluster sample* | National level | 2010 | Students in grade 8,9 and 10** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-report on answer sheet** | 13-15 | 77.2%** | Female | N/S | N/S | N/S | 16 |
| Oman (number of studies = 5) | | | | | | | | | | | | | | | | |
| Mabry, 2016⁷ | Kilani, 2013 ¹⁷³ | Population-based survey (CS**) | MCRO** | Muscat** | 2010** | Adolescents (Secondary-school students **) | Mean hours of computer time/wk | ATLS | Face-to-face interviews** | 15-18 | 3.3 hrs/wk | Male and Female* | 802** | N/S | N/S | 15 |
| Systematic review source | Study source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administra tion | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sampl e size | Res p - rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|------------------|---------|---------------------------|-------------|------------------------------------------------|------------------------------------------------|---------------------------|----------------|---------------------------------|---------|--------------|----------------|-------------|
| Mabry, 2016 | Kilani, 2013 173 | Population-based survey (CS**) | MCRS** Muscat** | 2010** Adolescents (Secondary-school students **) | Mean hours of computer time/wk | ATLS Face-to-face interviews** | 15-18 | 3.3 hrs/wk | Male | 360** | 44.9** | N/S | 15 |
| Mabry, 2016 | Kilani, 2013 173 | Population-based survey (CS**) | MCRS** Muscat** | 2010** Adolescents (Secondary-school students **) | Mean hours of computer time/wk | ATLS Face-to-face interviews** | 15-18 | 2.7 hrs/wk | Female | 442** | 55.1** | N/S | 15 |
| Mabry, 2016 | Kilani, 2013 173 | Population-based survey (CS**) | MCRS** Muscat** | 2010** Adolescents (Secondary-school students **) | Mean screen time (hrs/d) | ATLS Face-to-face interviews** | 15-18 | 3.31 hrs/d** | Male and Female* | 802 | 44.9** | N/S | 15 |
| Mabry, 2016 | Kilani, 2013 173 | Population-based survey (CS**) | MCRS** Muscat** | 2010** Adolescents (Secondary-school students **) | Mean screen time (hrs/d) | ATLS Face-to-face interviews** | 15-18 | 2.86 ±SD 2.3 hrs/d | Male | 360** | 44.9** | N/S | 15 |
| Mabry, 2016 | Kilani, 2013 173 | Population-based survey (CS**) | MCRS** Muscat** | 2010** Adolescents (Secondary-school students **) | Mean screen time (hrs/d) | ATLS Face-to-face interviews** | 15-18 | 3.70 ±SD 2.9 hrs/d | Female | 442** | 55.1** | N/S | 15 |
| Mabry, 2016 | Youssef, 2013 180 | Population-based survey (CS**) | MCRS** Muscat** | 2011** Omani** secondary-school students | % TV time ≥3 hrs/d | Pre-tested questionnaire** Self-administrate d** | 15-20 | 23.2 % | Male and Female | 439 | Equal* * | N/S | 14 |
| Mabry, 2016 | Youssef, 2013 180 | Population-based survey (CS**) | MCRS** Muscat** | 2011** Omani** secondary-school students | % TV time ≥3 hrs/d | Pre-tested questionnaire** Self-administrate d** | 15-20 | 21.1 % | Male | 214** | 48.7** | N/S | 14 |
| Mabry, 2016 | Youssef, 2013 180 | Population-based survey (CS**) | MCRS** Muscat** | 2011** Omani** secondary-school students | % TV time ≥3 hrs/d | Pre-tested questionnaire** Self-administrate d** | 15-20 | 25.3 % | Female | 225** | 51.3** | N/S | 14 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Survival (%) | Responder rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|-----------------------------|-----------------|-----------------------------------------------|---------|-------------|--------------|-----------------|-------------|
| Mabry, 2016*             | Youssef, 2013 180 | Population-based survey (CS**) | MCRS** Muscat** | 2011** | Omanii** secondary -school students | % TV time ≥3 hrs/d | Pre-tested questionnaire** | Self-administrate d** | 15-20 | 29.20 % | Male and Female | 439 | Equal* | N/S | 14 |
| Mabry, 2016*             | Youssef, 2013 180 | Population-based survey (CS**) | MCRS** Muscat** | 2011** | Omanii** secondary -school students | % TV time ≥3 hrs/d | Pre-tested questionnaire** | Self-administrate d** | 15-20 | 26.6 % | Male | 214** | 48.7** | N/S | 14 |
| Yammine, 2016*           | Guthold, 2010 $10 | GSHS** | Two-stage RS** | National level** | Schoolchildren** | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d** | Validated PACE+ and Adolescent physical activity measure questionnaire** | Self-administrate d** | 14 (mean)** | 29.7%** | Male and Female | 2158* | Equal* | 97%* | 13 |
| Yammine, 2016*           | Guthold, 2010 $10 | GSHS** | Two-stage RS** | National level** | Schoolchildren** | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d** | Validated PACE+ and Adolescent physical activity measure questionnaire** | Self-administrate d** | 14 (mean)** | 34%** | Male** | 1133* | 52.5** | N/S | 13 |

*Note: The table shows the population-based survey data collected in Oman and the United Arab Emirates, with various years of data collection and different identifiers indicating the specific study populations and methodologies.
| Systematic review source | Study source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument admini- stration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sampl e size | χ² (%) | Res p - rate (%) | QA score (/21) |
|--------------------------|-------------|-------------|------------------|---------|--------------------------|-------------|-------------------------------------------------|-------------------------------------------------|--------------------------|----------------|-----------------------------------------------|---------|-------------|--------|----------------|------------|
| Sharara, 2018⁹          | GSWS, 2015⁵⁵ | School- based survey | Two-stage cluster sample* | National level (school) ** | 2015 | Students in grade 8-12** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-17 | 88.3% | Male and Female* | 3468 | N/S | 92* | * | 19 |
| Sharara, 2018⁹          | GSWS, 2015⁵⁵ | School- based survey | Two-stage cluster sample* | National level (school) ** | 2015 | Students in grade 8-12** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-17 | 84.6%** | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018⁹          | GSWS, 2015⁵⁵ | School- based survey | Two-stage cluster sample* | National level (school) ** | 2015 | Students in grade 8-12** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-17 | 91.7%** | Female | N/S | N/S | N/S | 16 |
| Sharara, 2018⁹          | Afifi, 2006⁶⁶ | School- based survey | MSRS** | National level | 2004 | Students from secondary schools** | Engaging in physical activities <once per week, apart from school physical education | Health practices scale ** | Self-reported** | 14-20 | 66.3% | Male and Female* | 5409 | Equal* | 96.3 | ** | 17 |

Bahrain (number of studies = 2)

| Mabry, 2016⁷ | Gharib, 2008¹³¹ | Population-based survey (CS**) | MCRS** | Eleven populated regions** | 1999-01** | Bahraini primary, intermediate and secondary ** school students | Mean hours of TV/Video/wk | Pilot-tested questionnaire** | Self-reported by students or parents** | 43269 | 21.35* hrs/wk | Male and Female* | 2594 | Equal* | * | N/S | 15 |
| Mabry, 2016⁷ | Gharib, 2008¹³¹ | Population-based survey (CS**) | MCRS** | Eleven populated regions** | 1999-01** | Bahraini primary, intermediate and secondary ** school students | Mean hours of TV/Video/wk | Pilot-tested questionnaire** | Self-reported by students or parents** | 43269 | 11.5 hrs/wk | Male | 1268* | 48.8** | N/S | 15 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measure | Gender | Sample size | ☀♂ (%) | Response rate (%) | QA score (/21) |
|-------------------------|-------------|--------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|-----------------------------|----------------|-----------------------------------------------|---------|------------|--------|----------------|-------------|
| **Kuwait (number of studies = 3)** | | | | | | | | | | | | | | | | | | | |
| Mabry, 2016 | Gharib, 2008 | Population-based survey (CS**) | MCRS** | Eleven populated regions** | 1999-01** | Bahraini primary, intermediate and secondary ** school students | Mean hours of TV/Video/ wk | Pilot-tested questionnaire** | Self-reported by students or parents** | 43269 | 31.2 | Female | 1326 hrs/wk ** | 51.1** | N/S | 15 |
| Sharara, 2018 | Musaiger, 2014 | CS** | MCRS** | National level (2006–2007) | <5days/week of playing sport | Questionnaire** | Self-reported** | 15-18 | 72.1% | Male and Female* | 735 | Equal* | N/S | 14 |

| Mabry, 2016 | Allafi, 2013 | Population-based survey (CS**) | MCRS** | Six Kuwaiti governorates** | N/S | Adolescents (Kuwaiti secondary school students* *) | % watch >2 hrs of TV/d | ATLS | Self-administrate d** | 14-19 | 71.2 %** | Male and Female* | 906 | Equal* | N/S | 12 |
| Mabry, 2016 | Allafi, 2013 | Population-based survey (CS**) | MCRS** | Six Kuwaiti governorates** | N/S | Adolescents (Kuwaiti secondary school students* *) | % watch >2 hrs of TV/d | ATLS | Self-administrate d** | 14-19 | 69.7 % | Male | 463** | 51.1** | N/S | 12 |
| Mabry, 2016 | Allafi, 2013 | Population-based survey (CS**) | MCRS** | 6 Kuwaiti governorates** | N/S | Adolescents (Kuwaiti secondary school students* *) | % watch >2 hrs of TV/d | ATLS | Self-administrate d** | 14-19 | 72.7 % | Female | 443** | 48.9** | N/S | 12 |
| Mabry, 2016 | Allafi, 2013 | Population-based survey (CS**) | MCRS** | 6 Kuwaiti governorates** | N/S | Adolescents (Kuwaiti secondary school students* *) | % use computers >2 hrs/d | ATLS | Self-administrate d** | 14-19 | 66 %** | Male and Female* | 906 | Equal* | N/S | 12 |
| Systematic review source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administra tion | Age group (years) | Physical inactivity or sedentary behavior measureme nt | Gender | Sampl e size | Res p - rate (%) | QA score (/21) |
|-------------------------|-------------|-----------------|---------|--------------------------|-------------|----------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------|-----------------------------------------------|--------|-------------|----------------|-------------|
| Mabry, 20167 | Allafi, 2013 174 | Population-based survey (CS**) | MCRS** | N/S | Adolescents (Kuwaiti secondary school students*) | % use computers >2 hrs/d | ATLS | Self-administrate d** | 14-19 | 62.1 % | Male | 463** | 51.1** | N/S | 12 |
| Mabry, 20167 | Allafi, 2013 174 | Population-based survey (CS**) | MCRS** | N/S | Adolescents (Kuwaiti secondary school students*) | % use computers >2 hrs/d | ATLS | Self-administrate d** | 14-19 | 70.0 % | Female | 443** | 48.9** | N/S | 12 |
| Sharara, 20188 | GSHS, 201598 | School-based survey | Two-stage cluster sample* | National level 2015 | Students in grade 8-11** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-17 | 82.9% | Male and Female* | 3637 | N/S | 78* | 18 |
| Sharara, 20188 | GSHS, 201598 | School-based survey | Two-stage cluster sample* | National level 2015 | Students in grade 8-11** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-17 | 81.0%** | Male | N/S | N/S | N/S | 15 |
| Sharara, 20188 | GSHS, 201598 | School-based survey | Two-stage cluster sample* | National level 2015 | Students in grade 8-11** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-17 | 84.9%** | Female | N/S | N/S | N/S | 15 |
| Sharara, 20188 | Shehab, 200599 | CS** | Multistage RSS** | Subnation al level | Students from 5th to 12th grades** | Only performing normal daily routine with some recreational activities or walking slowly and | Questionna ire** | Interviews** | 10-18 | 71.3% | Male and Female ** | 400 | Equal* | N/S | 10 |
| Systematic review source | Study source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measuremen t | Gender | Sampl e size | ♀ /♂ (% | Res p - rate (%) | QA score (/21) |
|-------------------------|--------------|--------------|-----------------|---------|--------------------------|-------------|-----------------------------------------------------------|-----------------------------------------------------------------|------------------------|-----------------|-----------------------------------------------|---------|-------------|---------------|----------------|----------------|
| **Libya (number of studies = 2)** |
| Yammine, Guthold, 2016⁶ | Survey | Two-stage RS | National level | 2007 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 13.9 (mean ) | 28.5** | Male and Female ** | 1354* | Equal | 98 | 16 |
| Yammine, Guthold, 2016⁶ | GSHS** | Two-stage RS | National level | 2007 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 13.9 (mean ) | 30 | Male | 681 | 50.3 | N/S | 13 |
| Yammine, Guthold, 2016⁶ | GSHS**, GSHS, 2007 | Survey | School-based | Two-stage cluster sample* | National level | Students in grade 7, 8 and 9 ** | < 60 mi per day on all seven days during the past seven days | Self-reported** | 10-19 ** | 83.4% ** | Male and Female ** | 2242 ** | Equal | 98 | 19 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition / study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%) | Response rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|-----------------------------------------------------------|---------------------------------------------------------------|---------------------------|-----------------|----------------------------------------------|--------|------------|------------|----------------|-------------|
| Sharara, 2018*           | GSHS, 2007** | School-based survey | Two-stage cluster sample* ** | National level | 2007 | Students in grade 7, 8 and 9 ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 10-19 ** | 78.5% ** | Male | 1123 ** | 50.1 ** | N/S | 16 |
| Sharara, 2018*           | GSHS, 2007** | School-based survey | Two-stage cluster sample* ** | National level | 2007 | Students in grade 7, 8 and 9 ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 10-19 ** | 88.4% ** | Female | 1119 ** | 49.9 ** | N/S | 16 |
| Djibouti (number of studies = 2) | | | | | | | | | | | | | | | | |
| Yammine, 2016*           | Guthold, 2010 $^6$ | GSHS** | Two-stage RS | National level | 2007 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 33** | Male and Female ** | 882 | ♂ > ♀ | 83 | 16 |
| Yammine, 2016*           | Guthold, 2010 $^6$ | GSHS** | Two-stage RS | National level | 2007 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 33 | Male | 526 | 59.6** | N/S | 13 |
| Yammine, 2016*           | Guthold, 2010 $^6$ | GSHS** | Two-stage RS | National level | 2007 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 33 | Female | 356 | 40.4** | N/S | 13 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % responders (%) | QA score (21) |
|--------------------------|-------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|--------------------------|----------------|---------------------------------------------|---------|-------------|-----------------|----------------|
| Sharara, 2018<sup>7</sup> | GSHS, 2007<sup>101</sup> | School-based survey | Two-stage cluster sample* | National level | 2007 | Students in class 5, 4, 3 and Other ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 85.1% | Male and Female* | 1777 | N/S | 83* | 19 |
| Sharara, 2018<sup>7</sup> | GSHS, 2007<sup>101</sup> | School-based survey | Two-stage cluster sample* | National level | 2007 | Students in class 5, 4, 3 and Other ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 81.2%** | Male | 707 | 39.8 | N/S | 16 |
| Sharara, 2018<sup>7</sup> | GSHS, 2007<sup>101</sup> | School-based survey | Two-stage cluster sample* | National level | 2007 | Students in class 5, 4, 3 and Other ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 90.8%** | Female | 1070 | 60.2 | N/S | 16 |

**Jordan (number of studies = 3)**

| Yellow| 2016<sup>6</sup> | Guthold, 2010 $^{10}$ | GSHS** | Two-stage RS | National level | 2004 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs/d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 41** | Male and Female ** | 1719 | Equal | 95 | 16 |
| Yellow| 2016<sup>6</sup> | Guthold, 2010 $^{10}$ | GSHS** | Two-stage RS | National level | 2004 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.4 (mean) | 41 | Male | 829 | 48.2 | N/S | 13 |
| Systematic review source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument admini- stration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sampl e size | ♂/♀ (%) | Res p - rate (%) | QA score (/21) |
|--------------------------|-------------|------------------|---------|----------------------------|-------------|-------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|----------------|-----------------------------------------------|---------|-------------|---------|--------------|-------------|
| Yammine, 2016 $^6$ | Guthold, 2010 $^10$ | GSHS** | Two- stage RS | National level | 2004 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionna ire | Self- administrate d | 14.4 (mean ) | 41 | Female | 890 | 51.8 | N/S | 13 |
| Sharara, 2018 $^8$ | GSHS, 2007$^{102}$ | School- based survey | Two- stage cluster sample* | National level | 2007 | Students in grade 8, 9 and 10** | < 60 min per day on all seven days during the past seven days | PACE+ Self- reported** | 13-15 | 85.6% | Male and Female** | 2197 | Equal | 99.8 ** | 19 |
| Sharara, 2018 $^8$ | GSHS, 2007$^{102}$ | School- based survey | Two- stage cluster sample* | National level | 2007 | Students in grade 8, 9 and 10** | < 60 min per day on all seven days during the past seven days | PACE+ Self- reported** | 13-15 | 81.8%** | Male | 1109 ** | 50.5 ** | N/S | 16 |
| Sharara, 2018 $^8$ | GSHS, 2007$^{102}$ | School- based survey | Two- stage cluster sample* | National level | 2007 | Students in grade 8, 9 and 10** | < 60 min per day on all seven days during the past seven days | PACE+ Self- reported** | 13-15 | 89.0%** | Female | 1088 ** | 49.5 ** | N/S | 16 |
| Sharara, 2018 $^8$ | Haddad, 2009 $^{103}$ | CS** | Multistage RSS** | Subnation al level (school) ** | N/S | Students from 7th and 8th grade** | Not very physically nor moderately active | Modified Adolescent Wellness Appraisal (AWA) Self- report** | 12-17 | 4% | Male and Female** | 530 | Equal* ** | N/S | 10 |
| Morocco (number of studies = 2) | | | | | | | | | | | | | | |
| Yammine, 2016 $^6$ | Guthold, 2010 $^10$ | GSHS** | Two- stage RS | National level | 2006 | Schoolchildren | % sitting and watching TV, computer games, talking with | Validated PACE+ and Adolescent physical activity | Self- administrate d | 14.1 (mean ) | 30** | Male and Female ** | 1735 ** | 84 | 16 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♂/♀ (%): Response rate (%) | QA score (/21) |
|--------------------------|--------------|----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|--------------------------|------------------|-----------------------------------------------|---------|-------------|---------------------------------|-------------|
| Yammine, 2016* | Guthold, 2010 $^\text{10}$ | GSHS** | Two-stage RS | National level | 2006 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.1 (mean) | 29 | Male | 926 | 53.4 | N/S | 13 |
| Yammine, 2016* | Guthold, 2010 $^\text{10}$ | GSHS** | Two-stage RS | National level | 2006 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administered | 14.1 (mean) | 31 | Female | 809 | 46.6 | N/S | 13 |
| Sharara, 2018* | GSHS, 2010$^\text{103}$ | School-based survey | Two stage cluster sample* | National level | 2010 | Students in Ist, 2nd and 3rd Prep** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-report on answer sheet** | 13-15 | 82.6% | Male and Female* | 2924 | N/S | 92* | 19 |
| Sharara, 2018* | GSHS, 2010$^\text{103}$ | School-based survey | Two stage cluster sample* | National level | 2010 | Students in Ist, 2nd and 3rd Prep** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-report on answer sheet** | 13-15 | 79.2%** | Male | 1620* | N/S | 55.4** | 16 |
| Sharara, 2018* | GSHS, 2010$^\text{103}$ | School-based survey | Two stage cluster | National level | 2010 | Students in Ist, 2nd and 3rd Prep** | < 60 min per day on five or more days during the | PACE+ | Self-report on answer sheet** | 13-15 | 86.7%** | Female | 1304* | N/S | 44.6** | 16 |
| Systematic review source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sampl e size | $\%$ | Res p - rate ($) | QA score (/21) |
|--------------------------|--------------|-----------------|---------|--------------------------|-------------|----------------------------------------------------------|---------------------------------------------------------------|--------------------------|----------------|------------------------------------------------------|--------|-------------|-----|----------------|----------------|
| sample*                  | past seven days | | | | | | | | | | | | | | | |

Egypt (number of studies = 4)

| Study | Sample size | Gender | Res p - rate (%) | QA score (/21) |
|-------|-------------|--------|-----------------|----------------|
| Yammine, 2016 | 3664* | Male and Female | 36.4 | 87 | 16 |
| Guthold, 2010 | 1975 | Male | 53.9 | N/S | 13 |
| GSHS**, Two-stage RS | National level | 2006 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 13.5 (mean ) | 22 | Male and Female | 87 | 13 |
| Yammine, 2016 | 5249 | Female | 46.1 | N/S | 13 |
| Guthold, 2010 | 1689 | Female | 46.1 | N/S | 13 |
| GSHS**, Two-stage RS | National level | 2006 | Schoolchildren | % sitting and watching TV, computer games, talking with friends or another sitting activities ≥ 3 hrs /d | Validated PACE+ and Adolescent physical activity measure questionnaire | Self-administrate d | 13.5 (mean ) | 24 | Female | 87* | 19 |
| Sharara, 2018 | 5249 | Male and Female | 87* | N/S | 19 |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | ♀ / ♂ (% | Response rate (%) | QA score (/21) |
|-------------------------|--------------|--------------|----------------|---------|--------------------------|------------|-------------------------------------------------|-----------------------------|-----------------|-------------------------------------------------|---------|-------------|-----------|----------------|-------------|
| Sharara, 2018⁹ | GSHS, 2006¹⁰⁵ | School-based survey | Two-stage cluster sample* | National level | 2006 | Students in Prep first, second and third grade** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 85.5%** | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018⁹ | GSHS, 2006¹⁰⁵ | School-based survey | Two-stage cluster sample* | National level | 2006 | Students in Prep first, second and third grade** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 96.6%** | Female | N/S | N/S | N/S | 16 |
| Sharara, 2018⁹ | Salazar-Martinez, 2006¹⁰⁶ | CS** | MCRS ** | National level | 1997 | students were in junior high, high school or at the university ** | Not engaged in sports | Questionnaire** | Self-reported** | 11-19 | 62.3% | Male and Female* | 1502 | Equal* | N/S | 13 |
| Sharara, 2018⁹ | Shady, 2015¹⁰⁷ | CS** | N/S | Subnational level (2 primary schools)** | N/S | Prepubescent students* | < 4 hours/week | Questionnaire** | Self-reported** | 9-11 | 65.5% | Male and Female* | 200 | Equal* | N/S | 8 |
| Lebanon (number of studies = 2) | Sharara, 2018⁹ | GSHS, 2011¹⁰⁸ | School-based survey | Two-stage cluster sample* | National level | 2011 | Students in grade 7, 8 and 9** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 65.4% | Male and Female* | 2286 | N/S | 87* | 19 |
| Sharara, 2018⁹ | GSHS, 2011¹⁰⁸ | School-based survey | Two-stage cluster sample* | National level | 2011 | Students in grade 7, 8 and 9** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 57.6%** | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018⁹ | GSHS, 2011¹⁰⁸ | School-based survey | Two-stage cluster | National level | 2011 | Students in grade 7, 8 and 9** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 72.3%** | Female | N/S | N/S | N/S | 16 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | QA score (%/21) | Response rate (%) |
|--------------------------|-------------|----------------|---------|--------------------------|------------|---------------------------------------------------------|-------------------------------------------------------------|---------------------------|----------------|--------------------------------------------------|---------|-------------|----------------|------------------|
| Sharara, 2018*           | CS **       | MCRS**         | Subnational level (households) | 2009 | Children and adolescent 6yrs old** | Moderate intensity activities included: playground activities, brisk walking, dancing, and bicycle riding. Higher intensity activities included: ball games, jumping rope, active games involving running and chasing, and swimming | Questionnaire** | Face to face interviews** | Mean: 13.06 | 32.6% | Male and Female* | 868 | Equal* | N/S | 15 |

Iraq (number of studies = 1)

| Sharara, 2018*           | GSHS, 2012* | School-based survey | Two-stage cluster sample* | National level | 2012 | Students in grade 1st, 2nd, and 3rd Intermediate** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 12-15 | 80% | Male and Female* | 2038 | N/S | 88* | 19 |

| Sharara, 2018*           | GSHS, 2012* | School-based survey | Two-stage cluster sample* | National level | 2012 | Students in grade 1st, 2nd, and 3rd Intermediate** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 74.7%** | Male | N/S | N/S | 16 |

| Sharara, 2018*           | GSHS, 2012* | School-based survey | Two-stage cluster | National level | 2012 | Students in grade 1st, 2nd, | < 60 min per day on five or more days | PACE+ | Self-reported** | 13-15 | 86.4%** | Female | N/S | N/S | 16 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Q/A score (/21) |
|-------------------------|-------------|----------------|---------|--------------------------|------------|-------------------------------------------------|-------------------------------------------------|--------------------------|-----------------|-------------------------------------------------|--------|-------------|---------------|
| Sharara, 2018*          | School-based survey | Two-stage cluster sample* | National level, Gaza strip** | 2010 | Students in grade 7th, 8th and 9th** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 75.8% | Male and Female* | 2677 | N/S | 95* |
| Sharara, 2018*          | School-based survey | Two-stage cluster sample* | National level, Gaza strip** | 2010 | Students in grade 7th, 8th and 9th** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 74.7%* | Male | N/S | N/S | 16 |
| Sharara, 2018*          | School-based survey | Two-stage cluster sample* | National level, Gaza strip** | 2010 | Students in grade 7th, 8th and 9th** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 86.4%** | Female | N/S | N/S | 16 |
| Sharara, 2018*          | School-based survey | Two-stage cluster sample* | National level, West Bank** | 2010 | Students in grade 7th, 8th and 9th** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 81.7% | Male and Female* | 1908 | N/S | 94* |
| Sharara, 2018*          | School-based survey | Two-stage cluster sample* | National level, West Bank** | 2010 | Students in grade 7th, 8th and 9th** | < 60 min per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 77.2%** | Male | N/S | N/S | 16 |
| Sharara, 2018*          | School-based survey | Two-stage cluster sample* | National level, West Bank** | 2010 | Students in grade 7th, 8th and 9th** | < 60 mins per day on five or more days during the past seven days | PACE+ | Self-reported** | 13-15 | 86.5%** | Female | N/S | N/S | 16 |

Palestine (number of studies = 3)
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Q/C (%) | Response rate (%) | QA score (/21) |
|--------------------------|--------------|--------------|----------------|---------|-------------------------|------------|---------------------------------|-------------------------------------------------|------------------------|----------------|-------------------------------------------------|--------|-------------|----------|----------------|-------------|
| Sharara, 2018<sup>8</sup> | Al Sabbah, 2007<sup>7,13</sup> | HSBC: CS RSS<sup>**</sup> | National level (West Bank and Gaza Strip) | 2003-2004 | Students of grades 6, 8, 10, and 12<sup>**</sup> | <60 mins/day, <5/7 days per week | WHO international HBSC questionnaire | Self-reported<sup>**</sup> | 12-18 | 80.0% | Male and Female<sup>*</sup> | 8885 | N/S | N/S | 16 | |
| Sharara, 2018<sup>7</sup> | Jildeh, 2011<sup>114</sup> | HBSC RSS<sup>**</sup> Multistage RSS<sup>**</sup> | Subnational level (School)<sup>**</sup> | 2002-2003 | Students of grades 6, 8, and 10<sup>**</sup> | <5 days per week active in sport for at least one hour + mode of transport to and from school<sup>**</sup> | First Palestinian National Health and Nutrition Survey Questionnaire (2000) | Interviews<sup>**</sup> | 11-16 | 77.6% | Male and Female<sup>*</sup> | 314 | Equal<sup>*</sup> | 100 | 19 | |
| Qatar (number of studies = 1) | | | | | | | | | | | | | | |
| Sharara, 2018<sup>7</sup> | GSHS, 2011<sup>115</sup> | School-based survey | Two-stage cluster sample<sup>*</sup> | National level | 2011 | Students in grade 7<sup>th</sup>- 9<sup>th</sup><sup>**</sup> | <60 min per day on five or more days during the past seven days | PACE+ Self-reported<sup>**</sup> | 13-15 | 85.0% | Male and Female<sup>*</sup> | 2021 | N/S | 87<sup>*</sup> | 19 | |
| Sharara, 2018<sup>7</sup> | GSHS, 2011<sup>115</sup> | School-based survey | Two-stage cluster sample<sup>*</sup> | National level | 2011 | Students in grade 7<sup>th</sup>- 9<sup>th</sup><sup>**</sup> | <60 min per day on five or more days during the past seven days | PACE+ Self-reported<sup>**</sup> | 13-15 | 80.1<sup>**</sup>% | Male | N/S | N/S | N/S | 16 | |
| Sharara, 2018<sup>7</sup> | GSHS, 2012<sup>116</sup> | School-based survey | Two-stage cluster sample<sup>*</sup> | National level | 2011 | Students in grade 7<sup>th</sup>- 9<sup>th</sup><sup>**</sup> | <60 min per day on five or more days during the past seven days | PACE+ Self-reported<sup>**</sup> | 13-15 | 89.8<sup>**</sup>% | Female | N/S | N/S | N/S | 16 | |
| Sudan (number of studies = 2) | | | | | | | | | | | | | | |
| Sharara, 2018<sup>7</sup> | GSHS, 2012<sup>116</sup> | School-based survey | Two-stage cluster sample<sup>*</sup> | National level | 2012 | Students in grade 8th basic, 1st & 2nd secondary | <60 min per day on five or more days during the past seven days | PACE+ Self-reported<sup>**</sup> | 13-15 | 89.0% | Male and Female | 2211 | N/S | 77<sup>*</sup> | 18 | |
| Sharara, 2018<sup>7</sup> | GSHS, 2012<sup>116</sup> | School-based survey | Two-stage cluster | National level | 2012 | Students in grade 8th basic | <60 min per day on five or more days | PACE+ Self-reported<sup>**</sup> | 13-15 | 89.1<sup>**</sup>% | Male | N/S | N/S | N/S | 15 | |
| Systematic review source | Study source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition/study | Physical inactivity or sedentary behavior instrument or used items | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | Response rate (%) | QA score (21) |
|--------------------------|--------------|--------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------|-----------------------------------------------|--------|--------------|----------------|-------------|
| Sharara, 2018³ | GSNS, 2012¹⁶ | School-based survey | Two-stage cluster sample* | National level | 2012 | Students in grade 8th basic, 1st & 2nd secondary | < 60 min per day on five or more days during the past seven days | Self-reported** | 13-15 | 88.8%* | Female | N/S | N/S | N/S | 15 |
| Sharara, 2018³ | Moukhyer, 2008¹⁷ | CS** | Cluster RS** | Subnation al level (household) ** | 2001 | Adolescents | Not engaging in sports activities | Self-report Questionnaire | 10-19 | 33.4% | Male and Female* | 1200 | Equal* | N/S | 13 |
| Syria (number of studies = 1) | | | | | | | | | | | | | | | |
| Sharara, 2018³ | GSNS, 2010¹⁸ | School-based survey | Two-stage cluster sample* | National level | 2010 | Students in grade 7, 8, 9 and 10** | < 60 min per day on five or more days during the past seven days | PACE+ | 13-15 | 84.9%** | Male and Female* | 3102 | N/S | 97* | 19 |
| Sharara, 2018³ | GSNS, 2010¹⁸ | School-based survey | Two-stage cluster sample ** | National level | 2010 | Students in grade 7, 8, 9 and 10** | < 60 min per day on five or more days during the past seven days | PACE+ | 13-15 | 81.9%** | Male | N/S | N/S | N/S | 16 |
| Sharara, 2018³ | GSNS, 2010¹⁸ | School-based survey | Two-stage cluster sample ** | National level | 2010 | Students in grade 7, 8, 9 and 10** | < 60 min per day on five or more days during the past seven days | PACE+ | 13-15 | 89.2%** | Female | N/S | N/S | N/S | 16 |
| Yemen (number of studies = 1) | | | | | | | | | | | | | | | |
| Sharara, 2018³ | GSNS, 2008¹⁹ | School-based survey | Two-stage cluster sample* | National level | 2008 | Students in grade 7, 8 and 9 ** | < 60 min per day on all seven days during the past seven days | Self-reported** | 13-15 | 84.8% | Male and Female* | 1175 | N/S | 82* | 19 |
| Sharara, 2018³ | GSNS, 2008¹⁹ | School-based survey | Two-stage cluster | National level | 2008 | Students in grade 7, 8 and 9** | < 60 min per day on all seven days during the | Self-reported** | 13-15 | 83.2%** | Male | N/S | N/S | N/S | 16 |
| Systematic review source | Study design | Sampling method | Setting | Years of data collection | Population | Physical inactivity or sedentary behavior definition /study | Instrument administration | Age group (years) | Physical inactivity or sedentary behavior measurement | Gender | Sample size | % Responder | Responder rate (%) | QA score (/21) |
|--------------------------|-------------|-----------------|---------|--------------------------|------------|----------------------------------------------------------|---------------------------|----------------|------------------------------------------------|---------|--------------|-------------|-------------------|-------------|
| Sharara, 2018⁹           | GSHS, 2008¹¹⁹ | School-based survey | Two-stage cluster sample* * | National level | 2008 | Students in grade 7, 8 and 9 ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 87.7%** | Female | N/S | N/S | 16 |

**Tunisia (number of studies = 3)**

| Sharara, 2018⁹           | GSHS, 2008¹²⁰ | School-based survey | Two-stage cluster sample* * | National level | 2008 | Students in grade 7, 8 and 9 ** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 81.5% | Male and Female* * | 2870 | N/S | N/S | 16 |

| Sharara, 2018⁹           | GSHS, 2008¹²⁰ | School-based survey** | Two-stage cluster sample ** | National level | 2008 | Students in grade 7, 8 and 9** | < 60 min per day on all seven days during the past seven days | PACE+ | Self-reported** | 13-15 | 73.8%** | Male | N/S | N/S | 16 |

| Sharara, 2018⁹           | CS**         | RS**             | National level | 2009-2010 | schoolchildren in the 7th and 9th grades | Doesn’t do recommended PA | Oxford Health Alliance for community intervention for health | Self-administered | 12-14 | 88.1% | Male and Female | 3987 | Equal* * | 91.5 ** | 16 |

| Sharara, 2018⁹           | CS**         | Two-stage cluster sample ** | National level | 2005 | Adolescents | < 3 Mets | Locally validated questionnaire | Self-administered | 15-19 | 29.4% | Male and Female | 2870 | Equal* * | 91.5 ** | 18 |

**Algeria (number of studies = 1)**

| Sharara, 2018⁹           | Abbes, 2016¹²³ | CS** | RS** | Subnational level | 2010-2011 | Students from level 1-5** | Not engaged in sports | Questionnaire** | Reported by parents** | 6-11 | 92.8% | Male and Female | 293 | ♀>♂ | 100 ** | 16 |
| Systematic review source | Study source | Study design | Samplin g method | Setting | Years of data collectio n | Populatio n | Physical inactivity or sedentary behavior definition /study | Physical inactivity or sedentary behavior instrument or used items | Instrument admini stration | Age group (years) | Physical inactivity or sedentary behavior measurem ent | Gender | Sampl e size | ♂/♀ (% | Res p - rate (%) | QA score (/21) |
|-------------------------|--------------|--------------|------------------|---------|---------------------------|-------------|------------------------------------------------|------------------------------------------------|--------------------------|-----------------|-------------------------------|---------|-------------|-------------|----------------|--------------|
| Sharara, 2018 \*         | Abbes, 2016  \*2\* | CS\*         | RS\*             | Subnation al level (school) \* | 2010-2011 Students from level 1-5\* | >3hrs watching TV, video games, computers ** | Questionnaire\* | Reported by parents\* | 6-11 | 71.67% ** | Male and Female ** | 293 | ♂>♀ | 100 ** | 18 |

Notes: All non-reported data was searched and extracted from the original study. Any additional information found relevant in the original study was added to the reported data for the purpose of completeness.

If not reported, the prevalence of the outcome among the total study population (males and/or females) was calculated using row or calculated data available in the original study. The calculated prevalence measure was reported and marked using two stars (**).

If not reported, the total sample size for each gender strata was calculated based on the percentage of males or females in the sample.

If not reported, the number for cases in each gender strata was calculated based on the reported prevalence and the total sample size in the strata.

If not reported, the total number for cases in the entire sample was calculated by the addition of the number of cases in each reported stratum.

For not reported mean time measures on the total study population, the overall males and females weighted mean time was calculated using mean time and the proportion of males and females in the sample, respectively.

If any discordance between the reported data in the SR and data available in the original study, this later was retained.

Extra studies are studies included in a SR and reporting one or more PA related outcome on MENA countries that were not reported in the SR (outcome or country not included in the SR). Extra data from these studies was extracted and used for the qualitative and quantitative synthesis.

Converted data from physical inactivity to PA was used only for the quantitative synthesis and was not reported in the above tables.

Abbreviations: SR: Systematic review; PA: Physical activity; VPA: Vigorous physical activity; MPA: Moderate physical activity; KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates; USA: United States of America; GCC: Gulf cooperation council; MENA: Middle-East and North Africa; QA: Quality assessment; ATLS: Arab teens lifestyle student questionnaire; GPAQ: Global Physical Activity Questionnaire; IPAQ: International Physical Activity Questionnaire: CS: Cross sectional; MCRS: Multistage stratified/cluster random sampling: RS: Random sampling: RCS: Random cluster sampling: RSS: Random stratified sampling; MET: Metabolic Equivalent of Task: VG: Video games; GSHS: Global School-based Student Health Survey; Resp-rate: response rate; N/S: Not stated; N/A: Not applicable; HBSC: Health Behavior in School-aged Children Survey; YRBSS: The Youth Risk Behavior Surveillance System, GSHS: Global School-based Student Health survey

† The use of a validated questionnaire was not reported in the original study.

‡ The use of Nurses’ Health Study II questionnaire was not reported in the original study.

*Calculated from reported data in the SR

**Calculated or reported from data in the original study

***Calculated from the prevalence measure reported in the original study (different from the prevalence measure reported in the SR)

$ This study was included in the SR of Yammine, 2016 6. Sedentary behavior data extracted from this study of Guthold, 2010 10 was not reported by the SR of Yammine, 2016 6.

♂: Males; ♀: Females; km: Kilometer; min: Minutes; wk: Week; d: Day; d-1: Per day; hrs: hours; h: hour

MJ: The megajoule is equal to one million (10^6) joules; Energy expenditure of >0.3 MJ/day is equivalent to walking daily for half an hour at 5 km/h
| Outcome definition | Measurement tool used for the outcome measurement | Main objective of the measurement tool (what it is developed for) | Country where used [Study reference] | Systematic review source | Official primary language of the country | Validated in the official primary language of the country | Validated among adults | Validated among youth |
|--------------------|-------------------------------------------------|-------------------------------------------------|----------------------------------|-------------------------|--------------------------------|--------------------------------|----------------|---------------------|
| Physical activity in adult general population | | | | | | | | |
| Active ≥600 METmin/wk | PA questionnaire** | Developed to assess leisure-type and sport-related physical activity. Measures type, duration, frequency, and habits of physical activity. | Saudi Arabia 12 | Sisson, 2008 | Arabic | No evidence | No evidence | No evidence |
| At least 600 MET-min/wk of vigorous or moderate activity | GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Saudi Arabia 25 UAE 168 | Mabry, 2010 Mabry, 2010 | Arabic Arabic | Yes 183 Yes 160 | No evidence | No evidence |
| Active 600 or more MET-min/wk | Measurement tool included items regarding sports and leisure activities | Developed to assess leisure-type and sport-related physical activity. Measures type, duration, frequency, and habits of physical activity. | Saudi Arabia 12 | Mabry, 2010 | Arabic | No evidence | No evidence | No evidence |
| At least 600 MET-min/wk of vigorous or moderate activity | IPAQ | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Saudi Arabia 81 Kuwait 171 | Mabry, 2010 Mabry, 2010 | Arabic Arabic | Yes 185 Yes 184 | No evidence | No evidence |
| 150 min of moderate-intensity PA/wk | IPAQ short version | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Saudi Arabia 81 | Mabry, 2016 | Arabic | Yes 185 Yes 184 | No evidence | No evidence |
| 150 min of moderate-intensity PA/wk | Validated questionnaire on leisure time PA and walking† | Developed to assess leisure-type and sport-related physical activity. Measures type, duration, frequency, and habits of physical activity. | Saudi Arabia 12 | Mabry, 2016 | Arabic | No evidence | No evidence | No evidence |
| 150 min of moderate-intensity PA/wk | GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Saudi Arabia 166 167 Oman 170 Qatar 140 | Mabry, 2016 | Arabic Arabic Arabic | Yes 183 Yes 160 | No evidence | No evidence |
| 150 min of moderate-intensity PA/wk | ATLS | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits among youth. | Saudi Arabia 67 | Mabry, 2016 | Arabic | Yes 150,186 | No evidence | Yes 150,186 |
| Vigorous level of PA - (Severe participation in physical exercises**) | Personal PA questionnaire | Developed to measure the prevalence of obesity in female university students within the United Arab Emirates. Collects data on age, obesity in | UAE 13 | Yammine, 2016 | Arabic | No evidence | No evidence | No evidence |
| Physical activity (min/wk) | Measurement tool | Developed | Arabic | No evidence | Yes 187 | No evidence |
|---------------------------|------------------|-----------|--------|-------------|---------|-------------|
| 150 min of moderate-      | Nurses’ Health    | Developed to ascertain the determinants of breast cancer and other major illnesses in young women (age range 25-42 years). Includes a physical activity questionnaire, which reports level of recreational physical activity participation weekly. 187 | Arabic | No evidence | Yes 187 | No evidence |
| intensity PA/wk           | Study II ‡       |           |        |             |         |             |
|                           | GPAQ             | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. 160 | Arabic | No evidence | Yes 183 | Yes 160     |
|                           |                 |           |        |             |         |             |
| Active: energy expenditure | Measurement tool | Developed to assess the high prevalence of diabetes in Bahrainis through collecting data on a participant’s demographics, medical history, and physical activity. 139 | Arabic | No evidence | No evidence | No evidence |
| >0.3 MJ d⁻¹ (equivalent to walking daily for 30 min at 5km/h**) | contained questions on walking, cycling and recreational activities based on which energy expenditure was calculated | | | | | |
|                           |                   |           |        |             |         |             |
| Active: walk ≥1 km d⁻¹    | Measurement tool  | Developed to assess the impact of physical activity and education level on obesity among adult Bahrainis by collecting data on a participant’s demographics, medical history, and physical activity. 138 | Arabic | No evidence | No evidence | No evidence |
|                           | contained WHO Heart and Health Questionnaire (validated in Arabic**) | | | | | |
| Active: walked or         | Measurement tool  | Developed to ascertain the relationship between hypertension and cardiovascular risk factors for Qatari adults (age range 25-65 years). Collects data on: basic demographics, physical activity, lifestyle and eating habits, personal and family medical history, and BMI. 137 | Arabic | No evidence | No evidence | No evidence |
| cycled for at least 30    | contained a question if person walked or cycled at least 30 min d⁻¹ | | | | | |
| min d⁻¹                   |                   |           |        |             |         |             |
|                           |                   |           |        |             |         |             |
| Physical activity in youth | Pedometer        | Developed to ascertain the difference between habitual physical activity (measured by a pedometer) between obese and non-obese Saudi schoolboys (age range 8-12 years). 128 | Arabic | No evidence | Yes 154,155 | Yes 152-155 |
| general population        |                 |           |        |             |         |             |
| Active ≥13,000 steps/d    |                   |           |        |             |         |             |
|                           | ATLS             | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. 186 | Arabic | Yes 150,186 | No evidence | Yes 150,186 |
| 60 min of moderate-       |                   |           |        |             |         |             |
| intensity 7 d/wk          |                   |           |        |             |         |             |
| Physical inactivity in adult general population | Moderate level of physical activity – (At least 60 min of PA per day on at least 5 days per week**) | Adolescent physical activity measure questionnaire (PACE+)** | Developed to assess health habits of children in school (age range 13-15 years). Instrument investigates the number of days during the past 7 days and during a normal week a child participates in physical activity for at least 60 minutes. 10 | UAE 10 | Yammine, 2016 6 | Arabic | Yes 189 | No evidence | Yes 189 |
| | Moderate level of PA- Moderate score of PA** | IPAQ short version | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. 184 | UAE 14 15 | Yammine, 2016 6 | Arabic | Yes 185 | Yes 184 | No evidence |
| | Moderate level of PA - (Vigorous exercise < 3 times/wk for about 60 min and > 30 min of moderate PA most days of the week**) | Personal physical activity questionnaire | Developed to assess the knowledge level about sport practice amongst secondary-school students in Dubai. Additionally, it assesses their attitudes and level participation in sports. 16 | UAE 16 | Yammine, 2016 6 | Arabic | No evidence | No evidence | No evidence |
| | Vigorous level of PA – (High score of PA**) | IPAQ short version | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. 184 | UAE 14 15 | Yammine, 2016 6 | Arabic | Yes 185 | Yes 184 | No evidence |
| | Vigorous level of PA- (Vigorous exercise ≥ 3 times/wk for about 20 min/session and also > 30 min of moderate PA most days of the week**) | Personal physical activity questionnaire | Developed to assess the knowledge level about sport practice amongst secondary-school students in Dubai. Additionally, it assesses their attitudes and level participation in sports. 16 | UAE 16 | Yammine, 2016 6 | Arabic | No evidence | No evidence | No evidence |
| | Inactive: <600 METmin/wk | PA questionnaire** | Developed to assess leisure-type and sport-related physical activity. Measures type, duration, frequency, and habits of physical activity. 12 | Saudi Arabia 12 | Sisson, 2008 3 | Arabic | No evidence | No evidence | No evidence |
| | Inactive: <600 METmin/wk | GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. 160 | Saudi Arabia 77 24 25,77,82,83 | Sharara, 2018 9 | Al-Hazzaa, 2018 9 | Arabic | Yes 183 | Yes 160 | No evidence |
| Physical Activity Level | Tool/Questionnaire | Description | Countries/Authors | Language | Evidence | Evidence | Evidence |
|------------------------|-------------------|-------------|-------------------|---------|----------|----------|----------|
| <600 METmin/wk         | Modified ATLS     | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. | Saudi Arabia 70, 85; Al-Hazzaa, 2018\(^5\) | Arabic | Yes | Yes 190, 191 | Yes 150, 186 |
| <600 METmin/wk         | IPAQ              | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Saudi Arabia 68, 81; Al-Hazzaa, 2018\(^5\); Sharara, 2018\(^9\) | Arabic | Yes \(^185\) | Yes \(^184\) | No evidence |
| <840 MET-min/week      | Questionnaire     | To assess the PA patterns, sedentary activities (e.g., daily TV/computer/DVD viewing time) and dietary habits. | Qatar\(^22\); Sharara, 2018\(^9\) | Arabic | No evidence | Yes 191 | No evidence |
| Inactivity: < 3 days of VPA at 20 min/session or <5 days MPA at 30 min/session | IPAQ short version ** | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Pakistan 11; Sisson, 2008\(^3\); Sisson, 2008\(^3\); Sharara, 2018\(^8\); Sharara, 2018\(^8\) | Urdu | Yes \(^185\) | Yes \(^184\) | No evidence |
| Inactivity: <30 minutes of moderate to vigorous activity most of the days (at least 4 days in last 7 days)** | IPAQ              | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Pakistan 17; Ranasinghe, 2013\(^5\) | Urdu | Yes \(^185\) | Yes \(^184\) | No evidence |
| <30 minutes ≥ 5 days/week Or <150 mins/week of moderate level of physical activity | GPAQ              | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Saudi Arabia 23\(^23\); Sharara, 2018\(^9\); Al-Hazzaa, 2018\(^8\) | Arabic | Yes \(^183\) | Yes 160 | No evidence |
| IPAQ                   | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Saudi Arabia 71, 76, 84 | Arabic | Yes \(^185\) | Yes \(^184\) | No evidence |
| Oxford Health Alliance Community Intervention for Health Project | ATLS              | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity. | Saudi Arabia 67 | Arabic | Yes | Yes 190, 191 | Yes 150, 186 |
| Questionnaire | Activity, obesity and overweight, and dietary habits among youth. | Saudi Arabia | No evidence | No evidence | No evidence |
|---------------|---------------------------------------------------------------|--------------|-------------|-------------|-------------|
| “How physically active are you” questionnaire | To assess healthy lifestyle among primary health care professionals. | Saudi Arabia | Yes | Yes | No evidence |
| Questionnaire | Developed to assess association of obesity with demographics including physical activity. Usual physical activity in work, method of going to and from work, leisure time and sports practice were considered in the questionnaire. | Morocco | No evidence | No evidence | No evidence |
| Questionnaire | To investigate physical activity levels across the five stages of change for physical activity and to identify motivational factors for physical activity according to these stages of change | Jordan | No evidence | No evidence | No evidence |
| Questionnaire | To assess association of cardiovascular disease risk factors with Hypertension | Lebanon | No evidence | No evidence | No evidence |
| Questionnaire | To assess determinants of physical exercise | Lebanon | No evidence | No evidence | No evidence |
| GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Kuwait | Yes | Yes | No evidence |
| IPAQ | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Saudi Arabia | Yes | Yes | No evidence |
| Questionnaire | Physical activity was assessed in relation to prevalence of metabolic syndromes. Activity levels of subjects were self-reported as sedentary, lightly active, moderately active, or very active | Kuwait | No evidence | No evidence | No evidence |
| Questionnaire | Developed to assess physical activity in terms of duration and frequency and its association with stroke symptoms among stroke free residents | Lebanon | No evidence | No evidence | No evidence |
| Physical Activity | Questionnaire | Purpose of the Questionnaire | Saudi Arabia | Sharara, 2018\(^9\) | Arabic | No evidence | Yes \(^{193}\) | No evidence |
|-------------------|--------------|------------------------------|-------------|--------------------------|-------|-------------|---------|------------|
| Not practicing in any regular sport and leisure time physical activity | CDC website questionnaire | To investigate barriers to healthy lifestyle. \(^{193}\) | Saudi Arabia \(^{21}\) | Sharara, 2018\(^9\) | Arabic | No evidence | Yes \(^{193}\) | No evidence |
| Not engaging in moderate activity (resulting in light sweating, small increases in breathing or heart rate) | Questionnaire | Developed to monitor the behaviors risk factors associated with chronic diseases like obesity and diabetes. | Jordan\(^{37,38}\) | Sharara, 2018\(^9\) | Arabic | No evidence | No evidence | No evidence |
| No strenuous exercise for \(\geq 3\) times per week | Lipid Research Clinic Questionnaire | To assess association between strenuous physical activity and obesity. | Saudi Arabia \(^{78}\) | Al-Hazzaa, 2018\(^8\) | Arabic | No evidence | Yes \(^{194}\) | No evidence |
| No non-vigorous physical activity for at least 20 minutes or 3 times per week) No exercise** | Questionnaire | Physical activity behaviour and sedentary lifestyle in terms of Frequency and type of current physical activity, Frequency of participation in a sports team, Students’ satisfaction with the performed physical activity, Average daily hours of watching television | Egypt\(^{44}\) | Sharara, 2018\(^9\) | Arabic | No evidence | No evidence | No evidence |
| No exercise | Questionnaire | Developed to investigate lifestyle risk factors and colorectal cancer To assess association of regular exercise with fatigue | Saudi Arabia \(^{20}\) | Sharara, 2018\(^7\) | Arabic | No evidence | No evidence | No evidence |
|  |  | To assess cardiovascular risk factors. Frequency of exercise was noted | UAE\(^{38}\) |  |  |  |  |  |
|  |  |  | Jordan\(^{39}\) |  |  |  |  |  |
To ascertain role of lifestyle factors in the development of colorectal cancer. Performing regular exercise, type and the frequency per week was considered

| Physical activity assessed to measure health behaviour | Egypt 46 |
| To investigate lifestyle patterns in smokers and non-smokers | Palestine 57 |

| No regular activity | Questionnaire | To assess physical activity profiles. Frequency and duration of the activity were accounted | Saudi Arabia 64, 72, 80 | Al-Hazzaa, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| Not engaging in regular physical activity | Questionnaire | To assess health related risk factors associated with physical inactivity | Kuwait 16, 33, Saudi Arabia 18, 21, 73, Egypt 45 | Sharara, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| Less than one-hour weekly activity | Questionnaire | To assess physical health status | Saudi Arabia 72, UAE 27, 29 | Sharara, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| <1 time per week | Questionnaire | To assess association of diet and physical activity with BMI | Saudi Arabia 69 | Hazzaa, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| <3 hours/week | Questionnaire | To assess health risk behavior | Lebanon 52 | Sharara, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| <3 times/week Or <3 days/week | Questionnaire | To assess exercise practices and stages of change in physical activity | Saudi Arabia 55, 66, 142 | Hazzaa, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| Less than 15 mins/ week of sport or brisk walking | Questionnaire | Developed to assess lifestyle related risk factors. | Syria 61 | Sharara, 2018 8 | Arabic | No evidence | No evidence | No evidence |
| <150 MET-min/ week | IPAQ | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Saudi Arabia 84 | Hazzaa, 2018 8 | Arabic | Yes 185 | Yes 184 | No evidence |
| Nil practice of PA – (Never participated in physical exercises**) | Personal physical activity questionnaire | Developed to measure the prevalence of obesity in female university students within the United Arab Emirates. Collects data on age, obesity in childhood and among parents, snacking, fast food consumption, and physical activity. | UAE | Yammine, 2016 | Arabic | No evidence | No evidence | No evidence |
|---------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------|------|---------------|---------|-------------|-------------|-------------|
| Mild level of PA – (Mild participation in physical exercises**) | Personal physical activity questionnaire | Developed to measure the prevalence of obesity in female university students within the United Arab Emirates. Collects data on age, obesity in childhood and among parents, snacking, fast food consumption, and physical activity. | UAE | Yammine, 2016 | Arabic | No evidence | No evidence | No evidence |

### Sedentary behavior in adult general population

| Mean amount of time spent sitting (Mean total time spent in sedentary activities (min/d)**) | GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Saudi Arabia | Mabry, 2010 | Arabic | Yes 183 | Yes 160 | No evidence |
|--------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------|---------------|------------|---------|---------|---------|-------------|
| Mean amount of time spent sitting | IPAQ | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | Kuwait | Mabry, 2010 | Arabic | Yes 185 | Yes 184 | No evidence |

### Sedentary (6+ hrs/d)

| GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Oman | Mabry, 2016 | Arabic | Yes 183 | Yes 160 | No evidence |

### Sedentary (3+ hrs/d)

| GPAQ | Developed to enable countries to surveil and collect information on the level of participation in physical activity in three settings. | Oman | Mabry, 2016 | Arabic | Yes 183 | Yes 160 | No evidence |

### Physical inactivity in youth general population

| Nil practice of PA- (Did not practice PA at all**) | Personal PA questionnaire | Developed to assess the knowledge level about sport practice amongst secondary-school students in Dubai. Additionally, it assesses their attitudes and level participation in sports. | UAE | Yammine, 2016 | Arabic | No evidence | No evidence | No evidence |
|--------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------|------|---------------|---------|-------------|-------------|-------------|
| Doesn’t do recommended PA | Oxford Health Alliance for community intervention for health | To determine the association between tobacco use and other lifestyle factors among schoolchildren. | Tunisia | Sharara, 2018 | Arabic | No evidence | No evidence | No evidence |
| Engaging in physical activities <once per week, apart from school physical education | Health practices scale | To assess 5 healthy practices: Sleep, breakfast, not eating between meals, not smoking and doing PA. | Oman | Sharara, 2018 | Arabic | No evidence | No evidence | No evidence |
| Health Risk Behaviors | Method | Details | Country | Language | Evidence | Evidence | Evidence |
|-----------------------|--------|---------|---------|----------|----------|----------|----------|
| Complete absence of exercise | Modified YRBSS and PACE+ | To identify the health risk behaviors and health status of adolescents. | Saudi Arabia<sup>88</sup> Sharara, 2018<sup>9</sup> | Arabic | No evidence | No evidence | No evidence |
| No regular exercise | Questionnaire | Apart from knowledge about T2DM, the questionnaire assessed the perceived benefits of and barriers to healthy lifestyle behaviours. | Saudi Arabia<sup>90</sup> Sharara, 2018<sup>9</sup> | Arabic | No evidence | No evidence | No evidence |
| Moderate intensity activities included: playground activities, brisk walking, dancing, and bicycle riding. Higher intensity activities included: ball games, jumping rope, active games involving running and chasing, and swimming | Questionnaire | To ascertain dietary, lifestyle and socioeconomic correlates of overweight, obesity and central adiposity. It assessed weekly frequency of physical activity outside school setting | Lebanon<sup>109</sup> Sharara, 2018<sup>9</sup> | Arabic | No evidence | No evidence | No evidence |
| < 3 Mets | Questionnaire | To determine associations between socio-demographic, lifestyle factors and anthropometric status and blood pressure status. Physical activity practised during the preceding month recorded using validated frequency questionnaire | Tunisia<sup>122</sup> Sharara, 2018<sup>9</sup> | Arabic | Yes<sup>195</sup> | No evidence | No evidence |
| Mild level of PA – (Low score of PA**) | IPAQ short version | Developed and tested for the population surveillance of adults (age range 15-69 years) and their level of physical activity. Physical activity levels are assessed across multiple domains. | UAE<sup>14</sup> 15 Yammine, 2016 6 Hazaa, 2018<sup>8</sup> | Arabic | Yes<sup>185</sup> | Yes<sup>184</sup> | No evidence |
| <420 MET-min/week | Personal PA questionnaire | Developed to assess the knowledge level about sport practice amongst secondary-school students in Dubai. Additionally, it assesses their attitudes and level participation in sports. | UAE<sup>16</sup> Yammine, 2016 6 | Arabic | No evidence | No evidence | No evidence |
| Mild level of PA- (No vigorous activity or irregularly practiced vigorous exercise < 60 min/wk and < 30 min of moderate PA most days of the week**) | Questionnaire | Developed to assess the knowledge level about low backache. The questionnaire included social factors, e.g., number of hours per week spent on recreational activities, ways of spending spare time, and level of physical activity. | Kuwait<sup>99</sup> Sharara, 2018<sup>9</sup> | Arabic | No evidence | No evidence | No evidence |
| Only performing normal daily routine with some recreational activities or walking slowly and doing no structured exercise | Questionnaire | To investigate factors associated with low backache. The questionnaire included social factors, e.g., number of hours per week spent on recreational activities, ways of spending spare time, and level of physical activity. | Kuwait<sup>99</sup> Sharara, 2018<sup>9</sup> | Arabic | No evidence | No evidence | No evidence |
| Occupation-related sedentary light PA for | Questionnaire | To investigate PA pattern apart from food consumption and smoking | Palestine<sup>56</sup> Sharara, 2018<sup>9</sup> | Arabic | No evidence | No evidence | No evidence |
| Activity/Questionnaire                                                                 | Description                                                                 | Country(s) | Language | Evidence Level | Evidence Level | Evidence Level |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------|-----------|----------------|----------------|----------------|
| Modified Adolescent Wellness Appraisal (AWA)                                           | To assess basic health knowledge and behaviors that most influence the health of adolescents. | Jordan, Sharara, 2018 | Arabic | No evidence | No evidence | No evidence |
| CDC Adolescent Health Survey Questionnaire                                              | Developed to collect information on socio-demographic factors, dietary habits, level of physical activity participation, and related behaviors. | Saudi Arabia, Sharara, 2018, Hazzaa, 2018 | Arabic | Unclear | Unclear | Unclear |
| Questionnaire                                                                         | To determine correlates of overweight and obesity among adolescents.         | Al-Rukban, 2003, Sharara, 2018 | Arabic | No evidence | No evidence | No evidence |
| Questionnaire                                                                         | To collect sociodemographic data and information on child’s diet and exercise behavior and investigate its association with overweight/obesity. | Saudi Arabia, Egypt, Sudan, Algeria, Sharara, 2018 | Arabic | No evidence | No evidence | No evidence |
| PACE+                                                                                 | Developed to assess health habits of children in school (age range 13-15 years). Instrument investigates the number of days during the past 7 days and during a normal week a child participates in physical activity for at least 60 minutes. | Sharara, 2018 | Arabic | Yes | No evidence | Yes |
| WHO international HBSC questionnaire                                                  | The international standard questionnaire enables the collection of common data across participating countries and thus enables the quantification of patterns of key health behaviours, health indicators and contextual variables. | Palestine, Saudi Arabia, Sharara, 2018, Hazzaa, 2018 | Arabic | No evidence | No evidence | Yes |
| Questionnaire                                                                         | To assess PA behavior predictors, reasons and barriers.                     | Palestine, Sharara, 2018 | Arabic | No evidence | No evidence | No |
| Questionnaire                                                                         | To assess physical activity among female adolescents.                       | Saudi Arabia, Sharara, 2018 | Arabic | No evidence | No evidence | No |
| PAQ-A                                                                                 | To assess moderate to vigorous activity score during the past 7 days**      | Saudi Arabia, Sharara, 2018 | Arabic | No evidence | No evidence | No |
| Based on weekly frequency: Never | Questionnaire | The questionnaire sought information about sun exposure (frequency and duration of exposure) and physical activity, which is self reported in terms of frequency and type of activities performed along with duration – number of minutes per week. | Saudi Arabia\(^9\) | Sharara, 2018\(^9\) | Arabic | No evidence | No evidence | No evidence |
|---------------------------------|--------------|----------------------------------------------------------------------------------------------------------------|-----------------|-----------------|--------|-------------|-------------|-------------|
| < 4 hours/week                  | Questionnaire | To investigate social, dietary and lifestyle factors associated with obesity.                            | Bahrain\(^2\)   | Sharara, 2018\(^9\) | Arabic | No evidence | No evidence | Yes* \(^{199}\) |
| <5 days/week of playing sport   | Accelerometer | To assess physical activity among girls aged 8-11 years.                                                 | Saudi Arabia 129 | Hazzaa, 2018\(^8\) | Arabic | No evidence | No evidence | Yes \(^{200}\) |
| <10000 step counts/ day         | Electronic pedometer | Developed to ascertain the difference between habitual physical activity (measured by a pedometer) between obese and non-obese Saudi schoolboys (age range 8-12 years). | Saudi Arabia 125,128 | Hazzaa, 2018\(^8\) | Arabic | No evidence | Yes* \(^{154},155\) | Yes* \(^{152-155}\) |
| Daily heart rate <159 bpm for atleast 20 min/day or Daily heart rate <140 bpm for at least 30min/day | Continuous heart rate monitoring\(^{201}\) | Physical activity level was obtained from heart rate telemetry.                                          | Saudi Arabia 126,127 | Hazzaa, 2018\(^8\) | Arabic | No evidence | Yes \(^{201}\) | Yes \(^{201}\) |
| <1680 METs-min/week             | ATLS         | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. | Saudi Arabia 124,145,147,147,171 168,167 | Sharara, 2018\(^8\) | Arabic | Yes \(^{150,186}\) | No evidence | Yes \(^{150,186}\) |
| Any bodily movement produced by skeletal muscles that resulted in energy expenditure above the basal level for at least 20 minutes per session** **<3 times/week | Questionnaire | To assess knowledge and pattern of physical activity among school students.                             | Saudi Arabia\(^{131}\) | Hazzaa, 2018\(^8\) | Arabic | No evidence | No evidence | No evidence |

### Sedentary behavior in youth general population

| Computer/TV time >2 hrs/d | ATLS | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. | Saudi Arabia 124 144 145 | Mabry, 2016 \(^{7}\) | Arabic | Yes \(^{150,186}\) | No evidence | Yes \(^{150,186}\) |
| Mean computer/TV time (hrs/d) | ATLS | Developed to assess the lifestyle habits of Arab adolescents and to study the | Saudi Arabia 145 | Mabry, 2016 \(^{7}\) | Arabic | Yes \(^{150,186}\) | No evidence | Yes \(^{150,186}\) |
| Mean computer/TV time (min/d) | Questionnaire to parents** | Developed to assess the levels of adiposity and physical activity in Saudi preschool children in Jeddah. Habitual physical activity was measured by electronic pedometers. | Saudi Arabia | Mabry, 2016 | Arabic | No evidence | No evidence | No evidence |
| Mean time watching TV (hrs/d) | ATLS | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. | Saudi Arabia | Mabry, 2016 | Arabic | Yes | No evidence | Yes |
| Mean computer time (hrs/d) | ATLS | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. | Saudi Arabia | Mabry, 2016 | Arabic | Yes | No evidence | Yes |
| Mean TV time (hrs/d) | Designed questionnaire** | Developed to collect data on the lifestyle and behavioral activities of study participants. Data collected on demographics, dietary habits, and health-related lifestyle variables (i.e. smoking, physical activity participation, TV watching, video-game playing etc.). | Saudi Arabia | Mabry, 2016 | Arabic | No evidence | No evidence | No evidence |
| Mean computer game time (hrs/d) | Designed questionnaire** | Developed to collect data on the lifestyle and behavioral activities of study participants. Data collected on demographics, dietary habits, and health-related lifestyle variables (i.e. smoking, physical activity participation, TV watching, video-game playing etc.). | Saudi Arabia | Mabry, 2016 | Arabic | No evidence | No evidence | No evidence |
| Watched > 3hrs TV/d | CDC Adolescent Health adapted questionnaire (Validated Arabic version**) | Developed to collect information on socio-demographic factors, dietary habits, level of physical activity participation, and related behaviors. | Saudi Arabia | Mabry, 2016 | Arabic | Unclear | Unclear | Unclear |
| >3 hrs watching TV, video games, computers | Questionnaire | To assess child’s diet and exercise behavior and investigate its association with overweight/obesity | Algeria | Sharara, 2018 | Arabic | No evidence | No evidence | No evidence |
| Indicator                                                                                  | Description                                                                                                                                                                                                 | Country        | Study (Year) | Language | Evidence | Quality | No Evidence | Unclear |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|----------|----------|---------|-------------|---------|
| ≥3 hrs TV time/d                                                                           | Validated questionnaire on the frequency of intake of certain food items and lifestyle**                                                                                                                                                                 | Saudi Arabia   | Mabry, 2016  | Arabic   | Unclear | Yes      | Yes                 |
| % TV viewing/Video games > 2 hrs/d                                                         | Questions related to TV viewing/VG use time**                                                                                                                                                                                                                   | UAE            | Mabry, 2016  | Arabic   | No evidence | No evidence | No evidence |
| Mean hours of computer time/wk                                                              | ATLS                                                                                                                                                                                                                                                                  | Oman           | Mabry, 2016  | Arabic   | Yes      | No evidence | Yes      |
| Mean screen time (hrs/d)                                                                    | ATLS                                                                                                                                                                                                                                                                  | Oman           | Mabry, 2016  | Arabic   | Yes      | No evidence | Yes      |
| % TV time ≥3 hrs/d                                                                         | Pre-tested questionnaire**                                                                                                                                                                                                                                           | Oman           | Mabry, 2016  | Arabic   | No evidence | No evidence | No evidence |
| Mean hours of TV/Video/wk                                                                   | Pilot-tested questionnaire**                                                                                                                                                                                                                                        | Bahrain        | Mabry, 2016  | Arabic   | No evidence | No evidence | No evidence |
| % watch >2 hrs of TV/d                                                                      | ATLS                                                                                                                                                                                                                                                                  | Kuwait          | Mabry, 2016  | Arabic   | Yes      | No evidence | Yes      |
% use computers >2 hrs/d | ATLS | Developed to assess the lifestyle habits of Arab adolescents and to study the interrelationships between various lifestyle variables. Investigates the prevalence of physical and sedentary activity, obesity and overweight, and dietary habits. 186 | Kuwait 174 | Mabry, 2016 7 | Arabic | Yes 150,186 | No evidence | Yes 150,186

Notes: The used PA definitions in the GPAQ, IPAQ, IPAQ short version are all equivalent. Energy expenditure of >0.3 MJ/day is equivalent to walking daily for half an hour at 5 km/h. Metabolic equivalent of task (MET): “A unit that represents the metabolic cost of physical activity. One MET is the rate of energy expenditure while sitting at rest, which, for most people approximates an oxygen uptake of 3.5 ml per kg per min. The energy expenditure of other activities is expressed in multiples of METs. For example, for the average adult, sitting and reading requires about 1.3 METs, strolling or walking slowly requires about 2.0 METs, and running at 5 miles per hour requires about 8.3 METS” 41.

Symbols:
*Validated to assess ambulatory activities using the number of steps and do note capture the pattern, the intensity or type of PA. Even if some studies have reported that the steps count could be equivalent to > 60 min moderate activity in youth 151 152-155, they don’t all agree on the threshold steps count. The reason we consider this definition non-standard.
** information extracted from the original publication of the primary study
† The use of a validated questionnaire reported by the SR was not mentioned in the original study.
‡ The use of Nurses’ Health Study II questionnaire reported by the SR was not mentioned in the original study.
¥ Validity refers to the appropriateness, meaningfulness, and usefulness of the questionnaire measure for a specific purpose. A questionnaire was considered validated if concepts and components of validity or reliability were evaluated and published. The use of a questionnaire in multiple studies was not considered as a proof of validity.
§ No evidence of a measurement tool validation in the original study and/or listed references.

Abbreviations:
PA Physical activity
SR Systematic review
MET Metabolic Equivalent of task
ATLS Arab teens lifestyle student questionnaire
GPAQ Global Physical Activity Questionnaire
IPAQ International Physical Activity Questionnaire
min Minutes
Wk week
MJ Megajoule (1 MJ is equal to one million 106 joules)
d day
d-1 per day
hrs hours
VG Video games
VPA Vigorous Physical Activity
MPA Moderate Physical Activity
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