Results from the Malaysia 2022 report card on physical activity for children and adolescents

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1. Introduction

Persistent trend of physical inactivity and sedentary behaviors among Malaysian children and adolescents are observed over the years and are concerning given the negative health consequences linked to physical inactivity, particularly in adulthood.1 Data from national surveys namely National Health Morbidity Survey (NHMS) 2017, NHMS 2019, Adolescent Healthy Survey (AHS) 2017 and South East Asian Nutrition Surveys I (SEANUTS I) Malaysia showed that more than half of children and adolescents did not participate in sufficient PA and were classified as having low physical activity (PA) levels.2,3 Sedentary behaviors among adolescents also showed an increasing trend which rose from 47.3% in 2012, to 50.1% in year...
In the year 2016, Malaysia participated in the Global Matrix 2.0 and developed the first Report Card on Physical Activity for Children and Adolescents, providing a summary for PA indicators among Malaysian children and adolescents. The results of the indicators compiled were, grade B given to School and Government indicators, grade D was given to Overall Physical Activity, Active Transportation, and Sedentary Behavior indicators, and grade F was assigned to Diet. Five of the remaining PA indicators were graded as INC (incomplete).

The 2016 report card revealed that Malaysian children and adolescents have low levels of PA, limited active travel, and high screen time. To continue providing an overview of the “state of the nation” in PA among children and adolescents, Malaysia took part in the Global Matrix 4.0 to develop the Malaysia 2022 Report Card on Physical Activity for Children and Adolescents. The 2022 Report Card provides an updated assessment of available evidence on PA related indicators of Malaysian children and adolescents aged 5–17 years. The aim of this paper is to summarize the process and full results of the 2022 Malaysia Report Card.

2. Methods

The 2022 Report Card was developed and produced by the Active Healthy Kids Malaysia Research Committee comprising the seven authors of this paper from Universiti Kebangsaan Malaysia. All members of the Research Committee were involved in identifying key data sources, evaluating evidence, and assigning grades, communicating with Steering Committee and Stakeholders, and disseminating the findings. Building upon the network established during the first Report Card, the Steering Committee and Stakeholders was extensively expanded for the 2022 Report Card to include all relevant experts in Malaysia. The grades and supporting evidence proposed by the Research Committee were agreed upon by the Steering Committee, which consists of 11 multidisciplinary local experts and government officials related to physical activity and health of children and adolescents. Following inputs by the Steering Committee, the proposed grades were presented, discussed, and agreed upon in a consensus meeting held with the Stakeholders, consisting of 14 representatives of government agencies, non-governmental organizations, and academia, who are actively involved in physical activity research and promotion.

The 2022 Report Card included 12 indicators which belongs to one of four categories: Daily Behaviors (Overall Physical Activity, Active Play, Active Transportation, Organized Sport and Physical Activity Participation, Sedentary Behaviors, Diet), Individual Characteristics (Physical Fitness, Weight Status), Settings and Sources of Influence (Family and Peers, School, Community and Environment), and Strategies and Investments (Government). All indicators are common to Global Matrix 4.0 except Diet and Weight Status which is an additional indicator set for Malaysia.

A scoping review using the Arksey and O’Malley framework with the enhancements from Levac et al. and Page et al. followed. The search terms considered in this review were selected according to the main concepts of the research question and the 12 indicators that were studied. Supplementary Table A shows the key search terms that were used in this scoping review and the duration of search is from Mac 2022 to June 2022. Data from multiple sources (Google, PubMed Central, Scopus, engagement with government officers) published in English or Malay language over the past six years (from 2016 to 2021) were reviewed and consolidated by the Research Committee to inform the 12 indicator grades. Such a period was applied to comprehensively capture available evidence after the first Malaysia Report Card was published in 2016. Exceptions were given to policy documents that were published earlier than 2016 but are still effective to date. The search for data sources included national surveys, published journal articles and government reports where physical activity and related health behaviors and settings were part of the outcome measures. While all available data were sourced, only studies and reports that are nationally representative of Malaysian children and adolescents aged 5–17 years, with sample size of at least 500 participants, were used to grade the 12 indicators. Studies involving children and adolescents with illness, physical disabilities, or those who were athletes or undergoing specialized training in sports, were excluded as well. Data obtained during the COVID-19 pandemic were not included as the main data source for grading PA indicators but are discussed in the full report card.

Briefly, after undergoing the scoping review framework, a total of 108 published articles and 28 reports were sourced and used to prepare the full report card (Fig. 1). Of these, only 18 reports with data meeting the ‘nationally representative’ and ‘at least 500 sample sizes’ criteria were used to inform the grade of the indicators, as summarized in Table 1. More details of these data sources in terms of sampling methods, characteristics of the participants, and major outcome measures are presented in the long form of the Report Card (available online at http://activehealthykids.org.my). Using the Active Healthy Kids Global Alliance (AHKGA) standardized grading framework, letter grades for each indicator were assigned by comparing prevalence of the health behavior or outcome, obtained from the evidence synthesized against the predefined grade benchmarks.

3. Results

The 2022 Malaysia Report Card is the second national, evidence-based evaluation of PA and the related contributing factors for children and adolescents in Malaysia. The grades assigned for the 12 indicators in the report card are presented in Table 2. In comparison with the 2016 Report Card, not much improvement on the grades were observed. Two of the six Daily Behavior indicators; Overall Physical Activity and Active Transportation, still obtained a poor grade of D-. While two indicators showed some improvements, which include Sedentary Behavior (from grade D to C) and Diet (from grade F to D-). For Settings and Sources of Influence, only School indicator could be graded, and showed an improvement from grade B to A-. As for Strategies and Investments, B is again assigned to Government. Four indicators (Organized Sports and Physical Activity, Active Play, Family and Peers, and Community and Environment) were graded INC due to lack of nationally representative data.

4. Discussion

4.1. Overall physical activity: D-

National data from the NHMS: AHS 2017 indicate that only one fifth (20%) of Malaysian adolescents aged 13–17 years old were physically active for a total of at least 60 min per day on 5 or more days per week. It is important to note that the data used to grade this indicator was not specific with regards to the intensity of the activities as recommended by the global and national recommendations, which is to accumulate at least 60 min of MVPA daily on average. Data was not available for children aged 5–12 years. A national representative data was limited since 2016 and there was no clear evidence that physical activity levels in children and adolescents have changed, hence the grade remains consistent with 2016.
4.2. Organized sports and physical activity participation: INC

Incomplete (INC) has been assigned to this indicator similar to the previous 2016 Report Card. This is due to the lack of consensus on a primary metric to be graded and lack of evidence on how the nation is performing on organized sports and physical activity participation for both children and adolescents. Although all Malaysian school-going children and adolescents are compulsory to be involved in sports activities following the national policy, data on participation frequency are not being captured.

4.3. Active play: INC

Incomplete (INC) has again been assigned to this indicator, similar to the previous 2016 Report Card. This is a result from the absence of clearly defined benchmark or guidelines on active play and given there is lack of evidence on how the nation is performing on active play indicator for both children and adolescents.

4.4. Active transportation: D-

National data from NHMS: AHS 2017 representing the adolescents age group (13–17 years) indicates that only one-fifth (25%) of Malaysian adolescents use active transportation regularly to or from school. The results are similar to the 2016 Report Card which represented the children’s age group. No recent data were available for children aged 5–9 years and early adolescents aged 10–12 years. Thus, the grade remains the same as 2016.

4.5. Sedentary behaviors: C

National data from NHMS: Adolescent Nutrition Survey (ANS) 2017 indicates that 48.2% of Malaysian school-going adolescents aged 10–17 years watched television, used computer, and played video games for no more than 2 h per day. It is worth noting that the recent Canadian Sedentary Behavior Guidelines recommends no more than 2 h of recreational screen time daily for 5- to 17-year-olds. However, the definition of recreational screen time may differ in the Malaysian nationwide survey conducted in 2017, where screen time referred to the time spent on screen-based behaviors such as watching television, playing video games, and using the computer or surfing the internet without specifying recreational or non-recreational computer or surfing internet usage. However, the usage of computer or surfing the internet for non-recreational purposes may be limited in 2017 as prior to COVID-19 pandemic which all educational activities are mostly paper-based. Consequent to the COVID-19 pandemic when lockdowns were enforced and schools were closed, non-recreational screen-time among adolescents increased between the years 2020 till 2022, due to increased remote teaching and learning activities. In comparison with the 2016 Report Card, this indicator showed an improvement in grade from D to C which previously was represented the 7–12 years age group only. However, no screen time data was available for children aged 5–9 years for the current report card.

4.6. Physical fitness: B

Physical Fitness is a new indicator included in the 2022 Report Card. Available national data obtained from the National Physical Fitness Standard for Malaysian School Student (SEGAK), for adolescents aged 10–17 years, allowed the extent of flexibility (test protocol: Sit-and-reach, measured in cm) to be graded. Objective data showed that Malaysian adolescents (aged 10–17 years) rank in the 67th percentile for extent flexibility. Ranking was calculated by comparing the extent flexibility of Malaysian adolescents to international norms for sit-and-reach (cm). This indicates that the flexibility levels of Malaysian adolescents are average relative to international norms resulting in grade B. The other components of
physical fitness (cardiovascular fitness, muscle strength and endurance) carried out in SEGAK differs with the protocols used internationally and were not comparable with international norms. Hence, those data were not used for grading. There was also no available data for children aged 5–9 years.

4.7. Diet: D−

Diet is an additional indicator in 2022 Report Card, apart from the 10 core indicators of AHKG. Fruits and vegetables intake was chosen as the benchmark to grade the Diet indicator as there is currently a lack of a single summary measure of overall diet for the Malaysian population. Moreover, fruits and vegetables are a cornerstone of a healthy diet for growing children and has been previously shown to be associated with physical activity and sedentary behavior in children and adolescents. NHMS AHS 2017 data showed less than one-fourth of school-going adolescents aged 13–17 years self-reported achieving the recommended daily intake of fruits and vegetables. Children and adolescents aged 7–18 years are recommended to eat 2 servings of fruit and 3 servings of vegetables daily based on the Malaysian Dietary Guidelines for Children and Adolescents 2013. In addition, no national data were available for children aged 5–12 years. The grade for Diet Indicator showed an improvement from the previous 2016 Report Card which was based on primary school children, from grade F to D−.

4.8. Weight status: B−

Weight Status is a new additional indicator decided by the RWG to include in 2022 Report Card as weight status has is associated

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### Table 1

| Data source                                      | Year(s) data collected/document published | Ages/matrix reported (self-report or objective measure) | Contribution to indicators (1−12)* |
|-------------------------------------------------|------------------------------------------|--------------------------------------------------------|-----------------------------------|
| National Health and Morbidity Survey (NHMS): Adolescent Health Survey 2017‡ | 2017                                     | 13−17 years (SR)                                        | 1, 4, 7                           |
| NHMS: Adolescent Nutrition Survey 2017§         | 2017                                     | 10−17 years (SR)                                        | 5                                 |
| National Physical Fitness Standard for Malaysian School Student (SEGAK) 2010 ³ | 2019                                     | 10−17 years (O)                                         | 6                                 |
| NHMS 2019: Non-Communicable Diseases ¹           | 2019                                     | 5−17 years (O)                                          | 8                                 |
| Report on School Sports Infrastructure and Programmes Survey (i-KePS Report 2021)⁴  | 2021                                     | Schools nationwide                                      | 10                                |
| Policy for the Implementation of Co-Curricular Activities ⁵ | 1997                                     | 13−17 years (SR)                                        | 12                                |
| National Sports Policy 2009 ⁶                    | 2009                                     | 13−17 years (SR)                                        |                                   |
| National Community Policy ⁷                      | 2018                                     | 13−17 years (SR)                                        |                                   |
| National Landscape Policy ⁸                      | 2011                                     | 13−17 years (SR)                                        |                                   |
| Policy Options to Combat Obesity in Malaysia ⁹   | 2016                                     | 13−17 years (SR)                                        |                                   |
| National Strategic Plan for Active Living (NASPAL) 2019−2025 ¹⁰ | 2019                                     | 13−17 years (SR)                                        |                                   |
| Malaysia Education Blueprint 2013−2025 ¹¹        | 2013                                     | 13−17 years (SR)                                        |                                   |
| Ministry of Health Malaysia Strategic Plan 2016−2025 ¹² | 2016                                     | 13−17 years (SR)                                        |                                   |
| Malaysian Dietary Guideline for Children & Adolescent 2013 ¹³ | 2013                                     | 13−17 years (SR)                                        |                                   |
| Malaysia Physical Activity Guidelines 2017 ¹⁴  | 2017                                     | 13−17 years (SR)                                        |                                   |
| Strategic Plan for Health Promotion 2018−2020, Ministry of Health Malaysia ²⁰ | 2018                                     | 13−17 years (SR)                                        |                                   |
| Tax Reliefs for Lifestyle Expenses (Sports Equipment/Sports) ²¹ | 2019                                     | 13−17 years (SR)                                        |                                   |

Note. * Indicators: 1) Overall Physical Activity; 2) Organized Sports and Physical Activity Participation; 3) Active Play; 4) Active Transportation; 5) Sedentary Behavior; 6) Physical Fitness; 7) Diet; 8) Weight Status; 9) Family & Peers; 10) School; 11) Community and the Built Environment; 12) Government.
SR: Self-Report; O: Objective measure.

### Table 2

| Indicators                                      | Grades |
|-------------------------------------------------|--------|
| Daily Behaviors                                 |        |
| Overall Physical Activity                       | D−     |
| Organized Sports & Physical Activity Participation | INC   |
| Active Play                                     | INC    |
| Active Transportation                           | D−     |
| Sedentary Behaviors                             | C      |
| Diet                                            | D−     |
| Individual Characteristics                      |        |
| Physical Fitness                                | B      |
| Weight Status                                   | B−     |
| Settings and Sources of Influences              |        |
| Family and Peers                                | INC    |
| School                                          | A−     |
| Community and Environment                       | INC    |
| Strategies and Investments                      |        |
| Government                                      | B      |

Note. The grade for each indicator is based on the percentage of children and adolescents meeting a defined benchmark: A+: 94%−100%; A: 87%−93%; A−: 80%−86%; B+: 74%−79%; B: 67%−73%; B−: 60%−66%; C+: 54%−59%; C: 47%−53%; C−: 40%−46%; D+: 34%−39%; D: 27%−33%; D−: 20%−26%; F: <20%; INC is Incomplete data.

* New indicators in the 2022 Report Card.
† Graded based on self-reported data only.
‡ Graded based on device-measured data exclusively.
with PA especially in terms of physical fitness of children and adolescents. The benchmark for this indicator is the proportion of Malaysian children and adolescents who has a normal weight status according to age- and sex-specific Body Mass Index (BAZ) as defined by the WHO Growth Reference 2007. National data from the recent NHMS 2019 indicates that 60.2% of Malaysian children and adolescents aged 5–17 years had BAZ within the normal range, while about one third are overweight (15%) or obese (14.8%).

4.9. Family and Peers: INC

Incomplete (INC) has again been assigned to this indicator as in the previous 2016 Report Card, given there is lack of national data available for the relevant benchmarks. The benchmark for Family and Peers indicators is the percentage of family members who meet the PA guidelines and participate in PA with their children or adolescents or the percentage of children and adolescents with friends and peers who encourage and support them to be physically active. While data on physical activity of Malaysian adults are available (74.9% were physically active); it was not possible to identify the proportion of parents who met the physical activity guidelines.

4.10. School: A-

Out of the six benchmarks recommended by the AHKGA, only one benchmark was used to grade this indicator. Percentage of schools with students who have regular access to facilities and equipment that support physical activity was the only benchmark used, as the other benchmarks lack available national data. Grade A was assigned to the school indicator as 80% of the national primary and secondary schools in Malaysia have at least one sports field that supports PA for school children and adolescents. However, it is important to note that there is a lack of data on the condition of the school fields. This grade is the highest grade among all indicators and showed an increase in grade as compared to the 2016 Report Card that attained B+.

4.11. Community and Environment: INC

Incomplete (INC) grade has again been assigned to this indicator as in the previous 2016 Report Card. The reason being is lack of national data on the percentage of children and adolescents who report living in a safe neighborhood where they can be physically active, who have accessible and well-maintained facilities, parks and playground in their community, and uncaptured data from municipalities who report they have infrastructure specifically geared towards promoting PA.

4.12. Government: B

Using the HEPA PAT v2 tool and its Scoring Rubric, B grade was assigned to the government indicator assessing government policies/strategies/action plans and initiatives aiming at promoting active healthy lifestyle in children and adolescents that have been implemented in Malaysia. The same grade was also assigned in the previous 2016 Report Card. In Malaysia, there are six policies that falls under the education, environment and financial domains which includes promotion of physical activity as their main policy or included in some of their thrusts (i.e., 1 Student 1 Sports Policy, Policy for the Implementation of Co-curricular Activities, National Sports Policy, National Landscape Policy, National Community Policy, Tax relief for lifestyle sports/sports equipment). Five national strategic plans/blueprint/prioritization of policies to increase the promotion of physical activity across all ministries were also identified (i.e., National Strategic Plan for Active Living (NASPAL) 2019–2025, Strategic Plan of Ministry of Health Malaysia 2016–2020, Policy Options to combat obesity, and Malaysia Education Blueprint 2013–2025 and Strategic Plan for Health Promotion 2018–2020). In addition, the Ministry of Health Malaysia has also highlighted physical activity recommendations that includes the population of children and adolescents in two guidelines (i.e., Malaysian Dietary Guidelines for Children and Adolescents 2013, Malaysian Physical Activity Guide Line 2017). Although there are policies/strategies/action plans efforts in increasing physical activity, it is worth noting that more information about impact is required and future policy documents will benefit by including clear and detailed information about reporting, funding, monitoring and evaluation.

4.13. COVID-19 and physical activity

Social isolation and movement control orders imposed during the COVID-19 pandemic have significantly impacted children and adolescents’ PA behavior. According to a systematic review and meta-analysis, children and adolescents have experienced immeasurable reductions in physical activity during the COVID-19 pandemic. In Malaysia, self-reported data for adolescents showed a lack of PA during COVID-19 pandemic due to separation of home and school and inadequate exposure to outdoors. In addition, the emotional toll of boredom and online learning led to increasing use of electronic devices. The decrease in physical activity and increase in sedentary behavior could be due to the lack of motivation to engage in physical activity during the isolation and lockdown periods. It was previously shown that lack of motivation is one of the prominent factors that has impacted PA participation during the COVID-19. Therefore, there is a necessity for early PA interventions in children and adolescents starting from home to support the younger generation towards an active lifestyle in any form of future pandemic lockdown. A study involving preschoolers, including those from Malaysia, suggested that apart from encouraging indoor physical activities, providing opportunities for outdoor play that incorporate appropriate risk mitigation strategies, could potentially improve participation in physical activities during lockdown periods.

4.14. Strengths and limitations

The strengths of this Report Card include its inclusion of experienced members and a stakeholder representative from all sectors relevant to children and adolescent’s physical activity and health. However, similar to the previous 2016 Report Card, research gaps remain, which if addressed would have better informed the grades. Data sources used to inform the grades of most indicators (except for Physical Fitness and Weight Status) relied on self-report methods of data collection where there is a possibility that responses could have been biased. Furthermore, all indicators also stand to gain from more evidence-informed benchmarks, as currently they were based on a single benchmark only due to scarcity of data for the other benchmarks. Also, for the 2022 Report Card, most of the indicators were based on evidence from the adolescent age group whereby the grades are not likely to be representative of all children and adolescents in Malaysia. A study specifically designed to target the indicators and the predefined benchmarks would be beneficial for future development of the Report Card. Although there were some new data sources available for several indicators in the 2022 Report Card, the research gap remains, especially for Organized Sports and Physical Activity Participation, Active Play, Community and Environment, and Family and Peer Support. The lack of data for these indicators that were
graded as incomplete, precluded a comprehensive evaluation of PA at various levels of the socioecological model. It will be useful if future health-related studies in Malaysia could incorporate questions pertaining to these mentioned indicators.

5. Conclusion

The 2022 Report Card revealed that Malaysian children and adolescents are still caught in the “inactivity epidemic” as shown by the consistent poor grades of overall physical activity and sedentary behaviors despite a favorable setting and sources of influence, provided by schools and government policies. Compared with the 2016 Report Card, there is no obvious evidence of change for most of the indicators although some showed slight improvement. The results of these two Malaysia Report Cards on Physical Activity illustrate the need for more effort and timely research to comprehensively evaluate these indicators to capture both children’s and adolescents’ data at the national level.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jjesf.2022.11.001.

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