Results from Hong Kong's 2019 report card on physical activity for children and youth with special educational needs

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ABSTRACT

Background: Objective: The Active Healthy Kids 2019 Hong Kong Report Card on Physical Activity for Children and Youth with Special Educational Needs (SEN) provides evidence-based assessments for nine indicators of physical activity behaviors and related sources of influence for 6- to 17-year-olds with SEN in Hong Kong. This is the first Report Card for this population group in Hong Kong.

Methods: The best available data between 2008 and 2019 were reviewed by a panel of experts. Following the Active Healthy Kids Global Alliance (AHKGA) development process, letter grades were assigned to nine indicators (Overall Physical Activity, Organized Sport Participation, Active Play, Active Transportation, Sedentary Behaviors, Family & Peers, School, Community & Environment, and Government Strategies & Investments).

Results: Two behavior indicators (Overall Physical Activity: F; Sedentary Behaviors: D+) and two contextual indicators (School: B; Government Strategies & Investments: C-) were assigned a letter grade. The remaining indicators including Organized Sport Participation, Active Play, Active Transportation, Family & Peers, and Community & Environment were not graded due to insufficient data.

Conclusions: A majority of children and youth with SEN in Hong Kong are physically inactive and have a high level of sedentary behaviors. Schools are ideal settings to promote physical activity for this population. There is a need to develop a comprehensive surveillance system to monitor this population, assess efforts to improve the grades, and promote physical activity opportunities for children and youth with SEN.

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Background

Physical inactivity is a serious global health problem and its associations with non-communicable diseases are well documented.1 To achieve optimal health benefits, it is recommended that, regardless of having a disability, all children aged 5–17 years should accumulate at least 60 min of moderate-to-vigorous physical activity (MVPA) daily.1 Children and youth with special educational needs (SEN) or disabilities, however, are found to be insufficiently active and tend to adopt a sedentary lifestyle.2,3 Compared with children and youth with typical development, those with SEN are less physically active and are more at risk for overweight and obesity.4,5

The Active Healthy Kids Global Alliance (AHKGA) facilitates global effort promoting physical activity in children and youth, including the preparation and promotion of country-level report cards on the physical activity of children and youth.6 The Report Card is an evidence-based synthesis of the best available evidence on physical activity behavior and its related indicators in children and youth. “Global Matrix” initiatives of the AHKGA combine and compare results from multiple country Report Cards in an effort to facilitate cross-country learning to improve the grades.6,7 The Global Matrix 3.0 comprised 49 country Report Cards to assess
global trends in childhood physical activity; only two of them included children and youth with SEN or disabilities. The Netherlands was the first country to publish a Report Card that focused on children and youth with a chronic condition or disability. Finland, in its 2018 Report Card, examined four indicators (Overall Physical Activity, Organized Sport Participation, Active Transportation, Sedentary Behaviors) of physical activity in children and youth with disabilities, but did not assign letter grades. In general, children and youth with SEN or disabilities were found to be less likely to meet the physical activity recommendations than those without SEN or disabilities. Meanwhile it is unknown if Hong Kong children and adolescents with SEN are less physically active when compared with these two countries.

As a member of the AHKGA, Hong Kong published its first and second Report Cards among children and youth in 2016 and 2018, respectively. The results of these two Report Cards showed a high level of physical inactivity among Hong Kong children and youth, but there is still a lack of comprehensive synthesis of data for children and youth with SEN. Serving as an extension to the 2018 Hong Kong Report Card for Children and Youth with typical development, the Active Healthy Kids 2019 Hong Kong Report Card on Physical Activity for Children and Youth with SEN (hereinafter referred to as 2019 Hong Kong Report Card+) was produced. The purpose of this paper was to summarize the process and results of the 2019 Hong Kong Report Card+, the first of its kind in Hong Kong.

Methods

According to the operation guide on integrated education by the Government of Hong Kong Special Administrative Region (HKSAR), SEN was defined and categorized into ten disability types including physical disability (PD), visual impairment (VI), hearing impairment (HI), intellectual disability (ID), autism spectrum disorders (ASD), attention deficit/hyperactivity disorder (AD/HD), speech and language impairments (SLI), specific learning difficulties (SpLD), mental illness, and social development problems (SDP). It is noted that a dual-track mode is adopted for special education in Hong Kong. Students with SEN may attend regular schools, while those with more severe or multiple disabilities could be referred to special schools for intensive support services. In the 2019 Hong Kong Report Card+, students with these ten disability types were included as the target population.

The 2019 Hong Kong Report Card+ was produced following the systematic process set by the AHKGA. A Research Work Group was formed that worked closely to discuss the evidence, assign grades, communicate with stakeholders, and disseminate the findings. Furthermore, a group of stakeholders from different sectors (e.g., education, physical education, exercise science, public health, rehabilitation, professional organizations (e.g., sports medicine, physiotherapy), schools (e.g., special schools), governmental and non-governmental organizations) were invited to provide comments on the initial grades. The 2019 Hong Kong Report Card+ consisted of nine indicators including Overall Physical Activity and its subcomponents (Organized Sport Participation, Active Play, Active Transportation, Sedentary Behaviors) and settings and sources of influence that have a known impact on physical activity participation (Family & Peers, School, Community & Environment, and Government Strategies & Investments). Three additional indicators (Physical Fitness, Sleep, and Obesity) were included in the 2018 Hong Kong Report Card for children and youth with typical development. We did not include these three indicators in the 2019 Hong Kong Report Card+ due to limited evidence for children and youth with SEN in Hong Kong. A comprehensive search of the most recent academic and non-academic literature on each indicator was conducted, including published journal articles, local relevant journals, governmental and organizational reports (including completion reports of funded grants), as well as personal sharing. The initial search was completed in April 2018 and was restricted to the best available data in the past ten years, i.e. from January 2008 to April 2018. A second search was conducted in April 2019 to include the best available data from January 2008 to April 2019. Inclusion criteria were (1) the target population was Hong Kong children and youth (6–17 years) with SEN; (2) relevant to at least one of the indicators; and (3) representative sample (e.g., diversity of disability types, sample size).

The search yielded 44 sources of evidence. The Research Work Group conducted three meetings to evaluate the aggregated evidence and assign initial letter grades to each of the nine indicators according to the predefined benchmarks (Table 1) and the grading scheme formulated by the AHKGA (see Table 2). Among 44 located sources, 11 of them were used for assigning the grades (details are given below). The Research Work Group considered which source was the most appropriate for grading and considered: (1) characteristics of the sample (e.g., how recent/representative/relevant was the sample on which the measure was based?); and (2) measurement of the indicator (e.g., was there any evidence that the measurement was relatively unbiased such as the use of validated questionnaires and objective measures such as accelerometer?).

Two face-to-face consultation meetings were held to solicit views and comments on initial letter grades from 43 stakeholders who were representatives of higher education institutions (e.g., physical education, exercise science, public health, rehabilitation), professional organizations (e.g., sports medicine, physiotherapy), schools (e.g., special schools), governmental and non-governmental organizations between 2018 and 2019. An online consultation survey was also used to collect comments from stakeholders who were not available to attend the meetings. Agreement on the initial grades was achieved from 94% of the stakeholder members who provided written responses. The agreements for all initial grades ranged from 82% to 100%.

Results

The 2019 Hong Kong Report Card+ was the first Report Card for children and youth with SEN in Hong Kong and its cover page is shown in Fig. 1. Grades for all indicators are presented in Table 2 and compared to the 2018 Hong Kong Report Card that focused on children with typical development. Only two behavior indicators and two contextual indicators were assigned a grade. Overall Physical Activity and Sedentary Behaviors were graded F and D+, respectively. The indicator of School was graded B, whereas Government Strategies & Investments achieved a grade of C+. The rest of the indicators could not be graded due to insufficient data. This lack of data is in contrast to the situation for children with typical development which only had one incomplete grade (Active Play).

Discussion

Overall Physical Activity: F

Three data sources were used to assign a grade for this indicator, in which actual minutes spent in MVPA per day in children and youth with SEN were reported. Using accelerometers to assess physical activity, two studies showed that 0.4% of 6- to 23-year-olds (excluding data from participants aged > 18 years did not yield different result) with five SEN types (VI, HI, PD, ID, SDP) and 2.7% of 6- to 10-year-olds with developmental coordination disorder met the physical activity recommendation. Another study reported that
Active Play: INC

Six studies that assessed participation in leisure activities or physical activity in unstructured settings at school in children and youth with SEN were located.3,19–23 However, this indicator could not be graded because the outcome measures did not align with the benchmark. Future research in this area may consider including an additional benchmark “% of children and youth who participate in non-organized sport for at least once per week” as an outcome measure for surveillance monitoring.

Active transportation: INC

Two data sources were located for this indicator. In one study, 53.1% of children with ID (mean age: 12.1 years) used active transportation to get to and from school at least once per week.15 However, this indicator was not graded because the evidence was limited to one type of SEN. As well, the Government of HKSAR conducted a survey on the use of active transportation to get to and from school or training centres among 33,100 15- to 70-year-olds with disabilities. This data source, however, was not used for grading because the frequency of using active transportation was not reported specifically for the population of children and youth with disabilities.30 This indicator was therefore not graded.

Sedentary behaviors: D+

It is noteworthy that the benchmark for this indicator, i.e., % of children and youth who do not sit continuously for more than 60 min per day, is different with the commonly used one in the 2018 Hong Kong Report Card11 and the Global Matrix 3.0.7 It is due to two reasons: first, there was no evidence on screen-based sedentary behaviors for children and youth with SEN in Hong Kong; second, the well-established guidelines have recommended limited sitting for extended periods in addition to recreational screen time.22 As such, two data sources were used for generating a grade for this indicator. The results showed that 25.3% of 6- to 23-year-olds with five SEN types (VI, HI, PD, ID, SDP)3 and 43.8% of 6- to 10-year-olds with developmental coordination disorder14 did not

Notes: MVPA = moderate-to-vigorous physical activity; PE = physical education.

Table 2
Comparison of the grade assignment for Hong Kong children and youth with special educational needs (SEN) and typical development (TD).

| Indicator | Children and youth with SEN (2019) | Children and youth with TD (2018) |
|-----------|-----------------------------------|----------------------------------|
| Overall Physical Activity | F                                 | C-                                |
| Organized Sport Participation | INC                              | C                                 |
| Active Play | INC                              | INC                               |
| Active Transportation | INC                              | B+                                |
| Sedentary Behaviors | D+                              | C-                                |
| Family & Peers | INC                            | D-                                |
| School | B                                 | C                                 |
| Community & Environment | INC                            | B                                 |
| Government Strategies & Investments | C-                          | C                                 |

The grade for each indicator was based on the percentage achieving the benchmark from Table 1. A+ = 94–100%; A = 87–93%; B = 80–86%. B+ = 74–79%; B = 67–73%; C = 60–66%. C+ = 54–59%; C = 47–53%; C = 40–46%. D+ = 34–39%; D = 27–33%; D = 20–26%. F = <20%; INC = Incomplete data.

6.1% of children with ID (mean age: 12.1 years) met the physical activity recommendation using self-report data with a large sample size (n = 524).13 On average, 9.2% of children and youth with SEN met the benchmark of Overall Physical Activity indicator. It is worth noting that the other six data sources were located but they were not included for grading, because the outcome measures for physical activity did not align with the benchmark.10–21

Organized Sport Participation: INC

This indicator could not be graded due to insufficient data. Although several studies and school annual reports relevant to this indicator were located, the information reported did not align with the benchmark or only focused on a specific type of SEN.10,22–29 More surveillance data are needed for this indicator.

Active Play: INC

It is noteworthy that the benchmark for this indicator, i.e., % of children and youth who do not sit continuously for more than 60 min per day, is different with the commonly used one in the 2018 Hong Kong Report Card11 and the Global Matrix 3.0.7 It is due to two reasons: first, there was no evidence on screen-based sedentary behaviors for children and youth with SEN in Hong Kong; second, the well-established guidelines have recommended limited sitting for extended periods in addition to recreational screen time.22 As such, two data sources were used for generating a grade for this indicator. The results showed that 25.3% of 6- to 23-year-olds with five SEN types (VI, HI, PD, ID, SDP)3 and 43.8% of 6- to 10-year-olds with developmental coordination disorder14 did not
have prolonged sitting periods (i.e., 1 h at a time) based on accelerometer data. On average, approximately 35% of children and youth with SEN met the benchmark, thus the indicator of Sedentary Behaviors was assigned a grade $D^+$. Three other relevant data sources were located but not included for grading because the outcome measures did not align with the benchmark.\textsuperscript{15,19,20}

Family & Peers: INC

Only one data source was located for this indicator. In that study, direct observations were conducted for the support of family members and peers on physical activity participation in 147 children and youth with PD (mean age: 13.5 years) at both school and home settings.\textsuperscript{20} The results showed that 2.7% of participants were motivated to take part in physical activity by their fathers, 17% by their mothers, and 74.8% by their peers.\textsuperscript{20} However, this indicator was not graded because the sample was limited to one type of SEN.

School: B

One data source was used for determining a grade for this indicator. Direct observations on the physical activity opportunities and facilities were conducted in special schools and a total of 1124 children and youth with five SEN types (VI, HI, PD, ID, SDP) were involved.\textsuperscript{19} The results showed that 80% of special schools offered physical education class for $\geq 70$ min per week, and that 57.3% of the observed areas were supportive (i.e., usable, accessible, or equipped) of physical activity. The overall findings indicated that schools have made great efforts in promoting physical activity for children and youth with SEN. However, the impact of school support on children's physical activity participation need to be evaluated. Meanwhile other data sources including school annual reports were located but not used for grading\textsuperscript{31} because the information contained did not align with the benchmark. Taken together, this indicator was assigned a grade $B$ (68.7%).

Community & Environment: INC

No evidence was available for the grade assignment of this indicator. Two data sources (one government report, one annual report of an organization) that evaluated the accessibility of physical activity facilities in the community were found.\textsuperscript{36,37} However, the proportion of communities/municipalities that had infrastructure specifically for promoting physical activity in children and youth with SEN was not reported. There are large knowledge gaps and research needs to investigate the impact of community and environment on physical activity of children and youth with SEN in Hong Kong.

Government Strategies & Investments: C-

Three departments of the government of HKSAR collaborated and provided School Sports Programme to enable the students enrolled in special schools to participate in diverse sports activities during their school leisure time.\textsuperscript{38,39} In 2014, the Leisure and Cultural Services Department (LCSD) provided half-rate concession to
Holders of Registration Cards for people with disabilities of all ages and their carers for participating in sports programmes. In 2016–2017, LCSD pledged to “continue to offer concessionary rates for the elderly, full-time students, people under the age of 14, and persons with disabilities together with their carers”.

In a consultancy study on sport for people with disabilities, LCSD organized free recreational and sports programmes for people with disabilities each year; arranged coaches to provide outreach services at centres for people with PD; included sports activities for participation of persons with disabilities in recent Hong Kong Games and Sport for All Days; organised community recreation and sports programmes with disability organizations; and collaborated with the Hong Kong Joint Council for People with Disabilities to offer persons with disabilities and their carers to use swimming facilities free of charge on “Free Ride Day”. For the estimates of expenditure in 2018–2019 by LCSD, of the overall expenditure (ranging from HK$19.0 million to HK$22.9 million in 2013–2018) on sports development and activities, the proportion allocated specifically to persons with disabilities was 4.59% in 2013–14, 4.76% in 2014–15, 4.87% in 2015–16, 4.93% in 2016–17, and 4.18% in 2017–18. It was found that funding in 2017–18 showed a decrease compared with the previous four years. Given the emerging evidence of the Hong Kong government’s strategies and investments in physical activity promotion in persons with disabilities, this indicator was graded C+

In the recent Hong Kong Chief Executive’s policy address, the government of HKSAR made efforts in promoting a sporting culture in schools and increasing the provision of district facilities to promote sports for all. However, it is unclear if these efforts were directed specifically to children and youth with SEN. Meanwhile it was noted that some organizations provided supports for athletes with disabilities; however, it was unclear if they targeted children and youth.

**Comparisons**

With reference to Table 2, when compared with Hong Kong children and youth with typical development, children with SEN had lower grades in the behavioral indicators (Overall Physical Activity: C− vs. F; Sedentary Behaviors: C− vs. D+) but a better grade in the sources of influence indicators (School) than those with typical development. The indicator of Government Strategies & Investments received the same range of grade C. When compared with children and youth with disabilities in the Netherlands and Finland, the percentage of Hong Kong children and youth with SEN who met the international physical activity recommendation was the lowest. In both Hong Kong and the Netherlands, about half of the indicators were assigned “INC” grades.

**Strengths and limitations**

The 2019 Hong Kong Report Card+ is the first Report Card in Hong Kong for children and youth with SEN and the second of its kind in the world. This Report Card+ provides important information for surveillance and global comparisons. As five indicators (Organized Sport Participation, Active Play, Active Transportation, Family & Peers, and Community & Environment) could not be graded due to incomplete data, more research is warranted to identify priority needs and inform future strategies and interventions to tackle inactivity problems for children with SEN. In addition, the benchmarks applied in the Report Card+ were set by the AHKGA for children and youth with typical development. Future work should consider developing or adapting the existing benchmarks specifically for children and youth with SEN. Guidelines for physical activity and sedentary behavior may need to be disability type specific given the complexity of challenges experienced by children and youth with SEN.

**Conclusions**

The first Hong Kong Report Card+ shows that physical activity level is extremely low and sedentary behavior is high for children and youth with SEN in Hong Kong. Schools have potential to promote physical activity in children and youth with SEN. There are many surveillance and research gaps in physical activity in this population group. More efforts are needed to allow children and youth with SEN to meet the physical activity recommendations through comprehensive, strategic interventions at school, family and community levels. As the majority of the indicators could not be graded due to lack of relevant data, more funding should be allocated to studies that aim to assess these indicators for this population group.

**RediT authorship contribution statement**

Cindy Hui-Ping Sit: Conceptualization, Methodology, Project administration, Supervision, Writing - original draft. Jane Jie Yu: Formal analysis, Methodology, Writing - original draft. Wendy Yajun Huang: Methodology, Formal analysis, Writing - review & editing. Martin Chi-Sang Wong: Methodology, Writing - review & editing. Raymond Kim-Wai Sun: Methodology, Writing - review & editing. Mark S. Tremblay: Methodology, Writing - review & editing. Stephen Heung-Sang Wong: Conceptualization, Methodology, Supervision, Funding acquisition, Writing - review & editing.

**Declaration of competing interest**

The study was supported by the Tin Ka Ping Foundation. There are no conflicts of interest from funding sources or from manufacturer/commercial products. We declare that this manuscript has not been published elsewhere or are not being considered for publication elsewhere and the research reported will not be submitted for publication elsewhere until a final decision has been made as to its acceptability by the Journal.

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