



Contents lists available at ScienceDirect

Journal of Exercise Science & Fitness

journal homepage: www.elsevier.com/locate/jesf

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



Cindy Hui-Ping Sit^a, Jane Jie Yu^a, Wendy Yajun Huang^b, Martin Chi-Sang Wong^c,
Raymond Kim-Wai Sum^a, Mark S. Tremblay^d, Stephen Heung-Sang Wong^{a,*}

^a Department of Sports Science and Physical Education, The Chinese University of Hong Kong, Hong Kong

^b Department of Sport and Physical Education, Hong Kong Baptist University, Hong Kong

^c The Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong, Hong Kong

^d Children's Hospital of Eastern Ontario Research Institute, Ottawa, Canada

ARTICLE INFO

Article history:

Received 16 April 2020

Received in revised form

22 May 2020

Accepted 23 May 2020

Available online 24 May 2020

Keywords:

Sport

Active play

Sedentary behaviors

Disability

Adolescents

Schools

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.

© 2020 The Society of Chinese Scholars on Exercise Physiology and Fitness. Published by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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

* Corresponding author. Department of Sports Science and Physical Education, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong.
E-mail address: hsswong@cuhk.edu.hk (S.H.-S. Wong).

global trends in childhood physical activity; only two of them included children and youth with SEN or disabilities.⁷ The Netherlands was the first country to publish a Report Card that focused on children and youth with a chronic condition or disability.⁸ 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.⁹ 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.^{2,3} 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.^{10,11} 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).^{12,13} 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.¹³ 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.⁷ 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., higher education institutions, professional organizations, 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; we used a cut-off of 6 years instead of 5 years applied in the Global Matrix 3.0 because preschool education in Hong Kong provides program for children aged under 6 years; (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 indicators (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)³ and 2.7% of 6- to 10-year-olds with developmental coordination disorder¹⁴ met the physical activity recommendation. Another study reported that

Table 1
Benchmarks used to guide the grade assignment for indicators.

Indicator	Benchmark
Overall Physical Activity	% of children and youth who meet physical activity guideline of 60 min of MVPA daily
Organized Sport Participation	% of children and youth who participate in organized sport at least once per week
Active Play	% of children and youth who participate in non-organized sport for at least once per week
Active Transportation	% of children and youth who use active transportation to and from school at least once per week
Sedentary Behaviors	% of children and youth who meet the screen time guideline (≤ 2 h/day)
Family & Peers	% of children and youth who do not sit continuously for more than 60 min per day
School	% of parents who facilitate physical activity and sport opportunities for children and youth % of friends/peers who encourage and support physical activity for children and youth % of schools where the majority of students are offered at least 70 min of PE per week % of schools with students who have regular access to facilities and equipment that support physical activity % of schools that offer physical activity opportunities to the majority of their students in addition to PE
Community & Environment	% of communities/municipalities that report they have infrastructure specifically geared toward promoting physical activity
Government Strategies & Investments	Evidence of leadership and commitment in provide physical activity opportunities Allocated funds and resources for the implementation of physical activity promotion Demonstrated policy making progress

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%; 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 = 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 ($n = 524$).¹⁵ 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.^{16–21}

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.^{19,22–29} More surveillance data are needed for this indicator.

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.⁵⁷ 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



Fig. 1. Front cover page of the 2019 Hong Kong Report Card+.

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.^{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.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.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.¹⁹ The results showed that 80% of special schools offered physical education class for ≥ 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^{31–35} 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.^{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.^{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.⁴⁰ 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”.⁴¹ In a consultancy study on sport for people with disabilities,⁴² 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,⁴³ 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 schools⁴⁴ and increasing the provision of district facilities to promote sports for all.⁴⁵ 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.^{46–56} Thus, these sources were not included for grading.

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 Netherlands⁸ and Finland,⁹ 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.⁸ 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.

CRedit 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 Sum:** 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.

Acknowledgements

The authors wish to thank Miss Nocturne Ma for her assistance in the data search and synthesis for the 2019 Hong Kong Report Card+. Special thanks also go to Mr. Chan Yuk-lun, a graduate of Shine Skills Centre (Pokfulam) who designed the cover of 2019 Hong Kong Report Card+. This work was supported by the Tin Ka Ping Foundation.

References

1. World Health Organization. *Global Action Plan on Physical Activity 2018–2030: More Active People for a Healthier World*. Geneva: World Health Organization; 2018.
2. Rimmer JH, Marques AC. Physical activity for people with disabilities. *Lancet*. 2012;380(9838):193–195.
3. Sit CHP, Mckenzie TL, Cerin E, Chow BC, Huang WY, Yu JJ. Physical activity and sedentary time among children with disabilities at school. *Med Sci Sports Exerc*. 2017;49(2):292–297.
4. Jung J, Leung W, Schram B, Yun J. Meta-analysis of physical activity levels in youth with and without disabilities. *Adapt Phys Act Q (APAQ)*. 2018;35(4):381–402.
5. Stanish HI, Curtin C, Must A, Phillips S, Maslin M, Bandini LG. Does physical activity differ between youth with and without intellectual disabilities? *Disabil Health J*. 2019;12:503–508.
6. Tremblay M, Barnes J, González S, et al. Global Matrix 2.0: report Card grades on the physical activity of children and youth comparing 38 countries. *J Phys Act Health*. 2016;13(11 suppl 2):S343–S366.
7. Aubert S, Barnes JD, Abdeta C, et al. Global matrix 3.0 physical activity report

- card grades for children and youth: results and analysis from 49 countries. *J Phys Act Health*. 2018;15(suppl 2):S251–S273.
8. Burghard M, de Jong NB, Vlioger S, Takken T. 2017 Dutch report card(+): results from the first physical activity report card plus for Dutch youth with a chronic disease or disability. *Front Pediatr*. 2018;6:122.
 9. Kamppi K, Aira A, Halme N, et al. Results from Finland's 2018 report card on physical activity for children and youth. *J Phys Act Health*. 2018;15(suppl 2):S355–S356.
 10. Huang WY, Wong SH, Wong MCS, Sit CHP, Sum RKW, He G. Results from Hong Kong's 2016 report card on physical activity for children and youth. *J Phys Act Health*. 2016;13(suppl 2):S169–S175.
 11. Huang WY, Wong SH, Sit CHP, et al. Results from the Hong Kong's 2018 report card on physical activity for children and youth. *J Exerc Sci Fit*. 2018;17:14–19.
 12. Education Bureau. The government of the Hong Kong special administrative region. Operation guide on the whole school approach to integrated education. Available from: https://www.edb.gov.hk/attachment/en/edu-system/special/support/wsa/ie%20guide_en.pdf; August 2014. Accessed November 20, 2018.
 13. Education Bureau. The government of the Hong Kong special administrative region. Special arrangements for internal examinations for students with special educational needs. Available from: https://www.edb.gov.hk/attachment/en/curriculum-development/major-level-of-edu/special-educational-needs/supporting-resources/specialexamarrangement_20181210_en.pdf; November 2018. Accessed July 23, 2019.
 14. Sit CHP, Masters RS, Abernethy B, Capio CM, Ha AS, Yu JJ. *Physical Activity and Fundamental Movement Skills in Children with Developmental Coordination Disorder [project Final Report of Health and Medical Research Fund]*. 2017.
 15. Wang JJ, Gao Y, Kwok H, Huang WY, Li S, Li LP. Children with intellectual disability are vulnerable to overweight and obesity: a cross-sectional study among Chinese children. *Child Obes*. 2018;14(5):316–326.
 16. Fong SS, Lee VY, Chan NN, Chan RS, Chak WK, Pang MY. Motor ability and weight status are determinants of out-of-school activity participation for children with developmental coordination disorder. *Res Dev Disabil*. 2011;32(6):2614–2623.
 17. Fong SS, Chung JW, Cheng YT, et al. Attention during functional tasks is associated with motor performance in children with developmental coordination disorder: a cross-sectional study. *Medicine*. 2016;95(37):e4935.
 18. Fong SS, Vackova D, Choi AWM, Cheng YTY, Yam TTT, Guo X. Diversity of activity participation determines bone mineral content in the lower limbs of pre-pubertal children with developmental coordination disorder. *Osteoporos Int*. 2018;29(4):917–925.
 19. Sit CHP, McKenzie TL, Cerin E, McManus A, Lian JM. *Physical activity for children in special school environments [project final report of health and health services research fund]*. 2011.
 20. Sit CHP, Li R, McKenzie TL, et al. Physical activity of children with physical disabilities: associations with environmental and behavioral variables at home and school. *Int J Environ Res Publ Health*. 2019;16(8):e1394.
 21. Tsang WW, Guo X, Fong SS, Mak KK, Pang MY. Activity participation intensity is associated with skeletal development in pre-pubertal children with developmental coordination disorder. *Res Dev Disabil*. 2012;33(6):1898–1904.
 22. Fong SS, Lee VY, Pang MY. Sensory organization of balance control in children with developmental coordination disorder. *Res Dev Disabil*. 2011;32(6):2376–2382.
 23. Lee MY, Tsang FK, Chui MY. The needs of parents of children with visual impairment studying in mainstream schools in Hong Kong. *Hong Kong Med J*. 2014;20(5):413–420.
 24. Li C, Chen S. Exploring experiences of physical activity in special school students with cerebral palsy: a qualitative perspective. *Eur J Adapt Phys Act*. 2012;5(1):7–17.
 25. C.C.C. Mongkok Church Kai Oi school. 2017–2018 School Annual Report. Available from: <https://drive.google.com/file/d/1pi6Y5CPbXtEYH-YPwvxv0Mdz6kW1t6oc/view>; 2018. Accessed May 28, 2019.
 26. Shatin Public School. 2016–2017 school annual report. 2017. Available from: <http://www.shatinpublicschool.edu.hk/download/document/201711301452573097926.pdf>. Accessed May 28, 2019.
 27. Po Leung Kuk Yu Lee Mo Fan Memorial School. 2017–2018 school annual report. Available from: https://www.plkylmf.edu.hk/publishing/1819/sch_rep_17-18.pdf; 2018. Accessed May 28, 2019.
 28. The Mental Health Association of Hong Kong Cornwall School. 2016–2017 school annual report. Available from: <https://mhahk-cws.edu.hk/jit-school/php/webcms/files/upload/tinyMCE/Publish/pm1617repo.pdf>; 2017. Accessed May 28, 2019.
 29. Evangelize China Fellowship Holy Word School. 2016–2017 school annual report. Available from: http://www.holyword.edu.hk/sd/Uploads/school_file/2017-10-31/59f817e519741.pdf; 2017. Accessed May 28, 2019.
 30. Census and Statistics Department. The Government of the Hong Kong Special Administrative Region. Social data collected via the general household survey: special topics report - report No.62-Persons with disabilities and chronic diseases. Available from: <https://www.statistics.gov.hk/pub/B11301622014XXXXB0100.pdf>; December 2014. Accessed May 28, 2019.
 31. Li C, Chen S, Zhang J. A status analysis of the integrated physical education in Hong Kong elementary schools. *Asian J Sports Med*. 2010;7(1):35–41.
 32. Society of Boys' Centres Chak Yan Centre School. 2017–2018 school annual report. Available from: <http://www.cycs.edu.hk/opensdocs/201718%20school%20report.pdf>; 2018. Accessed May 28, 2019.
 33. Society of Boys' Centres Hui Chung Sing Memorial School. 2016–2017 school annual report. Available from: http://www.sbhcsms.edu.hk/pdf/AnnualReport/1617AnnualReport_final.pdf; 2017. Accessed May 28, 2019.
 34. HK Juvenile Care Centre Chan Nam Cheong Memorial School. 2016–2017 school annual report. Available from: http://www.hkcc.edu.hk/jit-school/php/webcms/files/upload/tinyMCE/school_docs/201617schoolreport.pdf; 2017. Accessed May 28, 2019.
 35. Hong Kong Red Cross Margaret Trench School. 2016–2017 school annual report. Available from: <http://203.198.70.179/wordpress/wp-content/uploads/2015/11/2016-2017-%E5%AD%B8%E5%B9%B4%E5%AD%B8%E6%A0%A1%E5%A0%B1%E5%91%8A.pdf>; 2017. Accessed May 28, 2019.
 36. Equal Opportunities Commission. Formal investigation report: accessibility in publicly accessible premises. Available from: http://www.eoc.org.hk/EOC/Upload/UserFiles/File/FL_Ass_e.pdf; June 2010. Accessed November 20, 2018.
 37. Hong Kong Blind Union. 2016–2017 annual report. Available from: https://www.hkbu.org.hk/uploads/files/annual_report-20180209160948-p.pdf; 2017. Accessed May 28, 2019.
 38. Department of Health, Education Bureau, Leisure and Cultural Services Department. The government of the Hong Kong special administrative region. Healthier lifestyle for primary school children. Available from: https://www.aud.gov.hk/pdf_e/e52ch04.pdf; March 2018. Accessed November 20, 2018.
 39. Leisure and Cultural Services Department. The government of the Hong Kong special administrative region. School sports programme application guide (special school) 2018–2019. Available from: https://www.lcsd.gov.hk/en/ssp/form/pdf/application_guide_ss_2018-2019.pdf; 2018. Accessed November 20, 2018.
 40. Leisure and Cultural Services Department. The government of the Hong Kong special administrative region. Public swimming pool monthly ticket scheme. Available from: <https://www.lcsd.gov.hk/en/beach/swim-intro/swim-ticket.html>; 2014. Accessed November 20, 2018.
 41. Leisure and Cultural Services Department. The government of the Hong Kong special administrative region. 2016–2017 annual report. Available from: https://www.lcsd.gov.hk/en/common/pdf/annual_report_1617_en.pdf; 2017. Accessed November 20, 2018.
 42. Dr. Stephen Hui Research Centre for Physical Recreation and Wellness, Hong Kong Baptist University. A consultancy study on sport for people with disabilities in Hong Kong. Available from: <https://www.gov.hk/en/residents/government/publication/consultation/docs/2016/Disabilities.pdf>; August 2016. Accessed November 20, 2018.
 43. Leisure and Cultural Services Department. The government of the Hong Kong special administrative region. Examination of estimates of expenditure 2018–19. Available from: <https://www.lcsd.gov.hk/en/common/images/en/doc/2018/HAB400-e.pdf>; 2018. Accessed November 20, 2018.
 44. The Government of the Hong Kong Special Administrative Region. The Chief Executive's 2017 policy address. 2017. Available from: <https://www.legco.gov.hk/yr17-18/english/panels/1718policy-e.pdf>. Accessed November 20, 2018.
 45. The Government of the Hong Kong Special Administrative Region. The Chief Executive's 2018 policy address. 2018. Available from: <https://www.policyaddress.gov.hk/2018/eng/pdf/PA2018.pdf>. Accessed May 28, 2019. Published 2018.
 46. Hong Kong Federation of Handicapped Youth. 2016–2017 annual report. Available from: http://www.hkfh.org.hk/upload/report/94/doc_zh/5a37660b7fafa.pdf; 2017. Accessed May 28, 2019.
 47. Hong Kong Paralympians Fund. Allocation of funding (1 April 2018 to 31 March 2019). Available from: https://www.swd.gov.hk/storage/asset/section/959/en/hkpf_update_2018-19_E.pdf; 2019. Accessed May 28, 2019.
 48. Hong Kong Sports Association for Persons with Intellectual Disability. 2008–2009 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/9.pdf; 2009. Accessed May 28, 2019.
 49. Hong Kong Sports Association for Persons with Intellectual Disability. 2009–2010 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/10.pdf; 2010. Accessed May 28, 2019.
 50. Hong Kong Sports Association for Persons with Intellectual Disability. 2010–2011 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/11.pdf; 2011. Accessed May 28, 2019.
 51. Hong Kong Sports Association for Persons with Intellectual Disability. 2011–2012 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/12.pdf; 2012. Accessed May 28, 2019.
 52. Hong Kong Sports Association for Persons with Intellectual Disability. 2012–2013 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/13.pdf; 2013. Accessed May 28, 2019.
 53. Hong Kong Sports Association for Persons with Intellectual Disability. 2013–2014 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/14.pdf; 2014. Accessed May 28, 2019.
 54. Hong Kong Sports Association for Persons with Intellectual Disability. 2014–2015 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/17.pdf; 2015. Accessed May 28, 2019.
 55. Hong Kong Sports Association for Persons with Intellectual Disability. 2015–2016 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/18.pdf; 2016. Accessed May 28, 2019.
 56. Hong Kong Sports Association for Persons with Intellectual Disability. 2016–2017 annual report. Available from: https://www.hksapid.org.hk/imgs/about_report/19.pdf; 2017. Accessed May 28, 2019.
 57. Tremblay M, Carson V, Chaput J-P, et al. Canadian 24-hour movement guidelines for children and youth: an integration of physical activity, sedentary behaviour, and sleep. *Appl Physiol Nutr Metabol*. 2016;41(6):S311–S327.