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Results from the Japan 2022 report card on physical activity for children and youth

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ABSTRACT

Background/Objective: The 2020 Tokyo Olympics and Paralympic was held in 2021, although postponed due to the spread of COVID-19. This event might have an impact on physical activity (PA) of children and adolescents, but the national data on PA during the pandemic were not available. Therefore, the goal of the 2022 Japan Report Card on Physical Activity for Children and Youth (The 2022 Japan Report Card) is to assess and track levels of health behaviors related to PA, and health outcomes in Japanese children and adolescents, and environments and government strategy for PA just before the pandemic.

Methods: The 2022 Japan Report Card consists of health behaviors and outcomes (8 indicators), and influences on health behaviors (4 indicators). Nationally representative data were used to score the indicators.

Results: The key five health behaviors and outcomes (Overall PA: B⁻; Organized Sport: B⁻; Active Transportation: A⁻; Physical fitness: B, Weight status: A) were favorable. Sedentary Behavior and Sleep received C⁻ and D⁻ grades, respectively. Active Play could not be graded (INC). In the influences domain, Family and Peers was graded as C⁻, while School (B⁺), Community and Environment (B), and Government (B) were favorable.

Conclusions: The 2022 Japan Report Card shows that Japanese children and adolescents had favorable levels of overall PA, active transportation to and from school, and weight status, and there was a generally favorable environment for PA and health, though sedentary behavior and sleep were unfavorable. Future nationally representative surveys on active play are needed.

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Abbreviations: JSA, Japan Sports Agency; PA, physical activity; Report Card, Report Card on Physical Activity for Children and Youth; HBSC, Health Behaviour in School-aged Children; HBSC-J, Japanese version of the HBSC questionnaire; MVPA, moderate-to-vigorous-intensity physical activity; SSF, Sasakawa Sports Foundation; MEXT, Ministry of Education, Culture, Sports, Science and Technology; PE, physical education.

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1. Introduction

The 2020 Tokyo Olympics and Paralympics was held in 2021. The Japan Sports Agency (JSA) promoted the Olympic and Paralympic movement, aiming to leave a tangible legacy in Japan.¹ This promotion was comprehensive and population wide, including practical education: experience of the Olympic and Paralympic Games, citizens' forums and citizens' events, watching and experiencing para-sporting events and activities. Thus, it is reasonable to hypothesize that the Olympic and Paralympic movement may

have an impact on sports participation in the pre-Olympic period and Olympic period in Japanese children and adolescents. Recently, Bauman et al.² showed that population physical activity (PA) and sports data shows little change in prevalence in participation immediately before or after Olympic Games since 1996. However, the Olympic Games impacts on children and adolescents alone have not been examined. Furthermore, nationally representative data on PA during the COVID-19 pandemic in Japan were only partially available. Therefore, it is the best to summarize the state of the nation for PA and health in Japan just before the COVID-19 pandemic. Specific assessments of the impact of the COVID-19 pandemic on report card indicators in Japan will take place in future.

Fifteen countries in 2014, 38 countries in 2016 and 49 countries in 2018 published Report Cards on Physical Activity for Children and Youth (Report Card), which were organized by the Active Healthy Kids Global Alliance.^{3–5} The first and second Japan Report Cards were developed and launched in 2016 and 2018 by Active Healthy Kids Japan.^{4,5} They assessed health behaviors such as active transportation, health outcomes such as weight status, and environmental factors for PA in children such as school environment, government strategies and investments. However, only Japan in 2016 and only Japan and Botswana in 2018 could not grade the indicator of overall PA because there was insufficient or missing information to assign a grade.^{4,5} Another global comparison on overall PA among adolescents also reported that Japan is one of the few countries with no data on overall PA for children and adolescents.⁶ Thus, the latest surveillance situation for overall PA in Japan needs to be examined.

Thus, the goal of the 2022 Japan Report Card is to assess overall PA level and levels of health behaviors related to PA, and health outcomes in Japanese children and adolescents, and environments and government strategy for PA, just before the COVID-19 pandemic. This report card is based on recent nationally representative surveys of Japanese school-aged children and adolescents.

2. Methods

The 2022 Japan Report Card was produced by a small research work group and based on the 2018 Japan Report Card⁷. The responsibilities of the groups were identifying nationally representative surveys on the ten common international indicators (Overall PA, Organized Sport and PA, Active Play, Active Transportation; Sedentary Behaviours, Physical Fitness, Family and Peers, School, Community and Environment and Government), and two additional indicators (weight status and sleep) and producing the final Report Card.

We used 5 surveys from all 47 prefectures for the 2022 Japan Report Card: 1) the Annual Report of National Survey on Physical Fitness, Athletic Performance, and Exercise Habits of the JSA, using a questionnaire and measuring physical fitness in two million students in 10, 11, 13 and 14 years^{8–11}; 2) the Annual Report of Physical Fitness Survey of JSA measuring physical fitness in 30,911 students in 6–17 years¹²; 3) the Annual School Health Survey of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) measuring weight statues in 695,600 students in 6–17 years¹³; and 4) the Annual National Health and National Survey using a questionnaire in 2,836 households¹⁴; and 5) the 2019 SSF National Sports-Life Survey using a questionnaire in 3,213 children and adolescents.¹⁵ Educational curricula, school facilities, relevant laws and ordinances, strategies and policies and PA guidelines by Japanese governments were also searched.

The latest published data available should be used for each Active Healthy Kids Report Card, in principle. When the grades

were determined for the present report card and study, the most recent government surveys were conducted in 2020. However, for the 2020 JSA survey, all prefectures were requested to conduct the survey by Japanese government, and the survey could be extended or the possibility of conducting the survey could be determined according to the impact of COVID-19 infection circumstances of each region (2021). As many prefectures were unable to conduct the survey as usual and sufficient data could not be collected, we decided to report the results as only advisory values. For this reason, the results of the 2019 survey were used in the present, third, Japanese report card. Moreover, there were no data in Active Transportation and Sedentary Behaviours on 2019 survey, so we used the data on the 2018 survey on the indicators for the present, 3rd Japanese Report Card.

The research work group searched for relevant evidence from nationally representative surveys within Japan as noted above. The grades used were as follows: A (A⁺ 94%–100%, A 87%–93% and A⁻ 80%–86%); B (B⁺ 74%–79%, B 67%–73% and B⁻ 60%–66%); C (C⁺ 54%–59%, C 47%–53%, C⁻ 40%–46%); D (D⁺ 34%–39%, D 27%–33%, D⁻ 20%–26%); F (<20%); and INC = Incomplete—insufficient or inadequate information to assign a grade.⁵

Two Japanese researchers outside the working group acted as external evaluators to assess the entire process. They raised questions such as the basis for grading on several indicators, including how the numbers were calculated, and who the target population was for the report card. As a result, the data used were reconsidered based on their suggestions and, finally, grading was carried out based on the data mentioned above. Moreover, the grades for ten common indicators were audited and approved by the Active Healthy Kids Global Alliance.

3. Results

The 2022 Japan Report Card is the third assessment of PA, health behaviours, outcomes and settings and influences on PA and health. Grades are summarized in Table 1. Fig. 1 shows the cover of the 2022 Japan Report Card.

4. Results and discussion

4.1. Overall physical activity

The grade was B⁻. As mentioned above, the first and second Japan Report Card could not grade the indicator of overall PA.^{4,5} The

Table 1
Grades assigned to indicators in the 2022 Japan Report Card on Physical Activity for Children and Youth.

Indicator	Grades
Overall Physical Activity	B ⁻
Organized Sport and Physical Activity	B ⁻
Active Play	INC
Active Transportation	A ⁻
Sedentary Behaviours	C ⁻
Physical Fitness	B
Weight Status	A
Sleep	D ⁻
Family and Peers	C ⁻
School	B ⁺
Community and Environment	B
Government	B

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



Fig. 1. Front cover of the 2022 Japan physical activity report card.

Health Behaviour in School-aged Children (HBSC) questionnaire was used most frequently to grade overall PA among the 38 countries (31.6%).¹⁶ We developed a Japanese version of the HBSC questionnaire (HBSC-J), which assesses daily overall PA.¹⁷ HBSC surveys have been conducted in 11-, 13- and 15-year-olds. Therefore, we examined the validity of the questionnaire using accelerometers as a criterion for Japanese fifth-grade elementary school students. The results showed a moderate correlation ($\rho = 0.34$, $p = .004$) between the number of days with moderate-to-vigorous-intensity PA (MVPA) of at least 60 min/day by the HBSC-J and the objectively measured MVPA (min/day). We expanded the target age range to include fifth and sixth graders for elementary school

students and first and third graders for junior high school students.¹⁸ The correlations were similar for both elementary school ($\rho = 0.39$, $p = .002$) and junior high school students ($\rho = 0.32$, $p < .001$). Finally, the HBSC-J was adopted for the first time in the 2019 SSF National Sports-Life Survey for 12-15-year-olds.¹⁵ The benchmark of overall PA in Active Healthy Kids Global Alliance Global Matrix 4.0 is percentage of children and adolescents meeting the Global Recommendations on Physical Activity for Health on at least 4 days a week. In 2019, SSF reported the results of overall PA using HBSC-J in the 2019 SSF National Sports-Life Survey¹⁵: 63% of 13- to 15-year-olds accumulated at least 60 min of MVPA per day on at least 4 days a week. A mean letter grade of overall PA was D in Active Healthy Kids Global Alliance Global Matrix 3.0.⁵ The present study grade of B⁻ in Japan is better than other 48 countries which participated in Active Healthy Kids Global Alliance Global Matrix 3.0 except for the Slovenia (A⁻) in 2018.⁵ However, in Global Matrix 3.0, percentage of children and adolescents who accumulate at least 60 min of MVPA every day meet the was shown, because global recommendation by WHO was changed in 2020. In the April 2022 SSF reported the results of overall PA using HBSC-J in the 2021 SSF National Sports-Life Survey during the COVID-19 pandemic.¹⁵ 60% of 13- to 15-year-olds accumulated at least 60 min of MVPA per day on at least 4 days a week. The prevalence was slightly worse than in the 2019 data. Thus, limitations in the data and the possible effects of both COVID-19 and the Olympics meant that influence of the Tokyo 2020 Olympics on adolescents PA could not be interpreted with confidence.

4.2. Organized sport and physical activity

The grade for this indicator, B⁻, was based on the prevalence of self-reported participation in sport (63%) from the Annual Report of Physical Fitness Survey of the JSA.¹² In comparison with 2018,⁷ the proportion of primary (55% in both 2018 and 2022) and junior high school students (78% in both 2018 and 2022) participating in sport remained the same, but the proportion of high school students slightly decreased (from 58% in 2018 to 56% in 2022). Also, a gender gap still exists in organized sport participation in Japan—the percentage of girl high school students participating (44%) was lower than that of boys (67%). A high percentage of junior high school students participate in sports clubs at school led by teachers. In order to reduce teachers' busy workload, including working on weekends to supervise sports club activities, weekend club activities at schools will be gradually transferred to community sports clubs from 2023. Rittsteiger et al.¹⁹ reported that the differences regarding parental socioeconomic status are much more apparent for organized sports than for unorganized sports, indicating the relevance of economic resources. Thus, the trends in the sports participation rate in Japan as a result of the changes in the system, will need to be monitored closely.

4.3. Active Play

The incomplete grades in the 2022 Japan Report Card as well as the 2018 Japan Report Card represent a lack of nationally representative data on active play. In addition, there are no Japanese government recommendations for active play. One opportunity for active play is school recess. According to the MEXT,²⁰ all schools offer recess to students from primary school to high school; however, school policy might affect how and how often students engaged in unstructured free play during the recess period. In the Global Matrix 3.0, 29/49 countries reported INC grades for Active Play.⁵ Suzuki et al.²¹ reported that Japanese primary school students who spent more time in the playground had more MVPA, using accelerometry. For Japanese primary school children, the

percentage of total daily accelerometer-measured MVPA during morning recess and lunch recess time, and school cleaning time was $19.4 \pm 6.8\%$ (15.2 ± 5.3 min/day) for boys and $16.9 \pm 5.8\%$ (10.5 ± 4.3 min/day) for girls.²² Thus, future surveillance of active and outdoor play in Japan should therefore be considered, and this domain of PA might be a neglected but potentially useful target of future strategies aimed at increasing PA.

4.4. Active Transportation

A grade of A⁻ was assigned according to the percentage of students who regularly commute actively to school (walking or cycling) (86%).⁹ The data used in the present study is the same as the 2018 Japan Report Card, because it was the most recent national data available.⁷ The grade for Active Transportation is A⁻, substantially higher than that of the other countries in the Active Healthy Kids Global Alliance, except for the Nepal and Zimbabwe (A⁻) as reported in Global Matrix 3.0 in 2018.⁵ Continuous nationally representative surveys on active transport to school are needed. Moreover, further research should be considered about other opportunities for active transportation (e.g. going to the park, sports clubs or cram schools).

4.5. Sedentary behaviors

The grade was C⁻. The national survey of the JSA in 2017 reported that 49% of 10 to-11 year-olds and 38% of 13 to-14 year-olds spent less than 2 h per day on a screen after school on weekdays and on weekends.⁹ The data used in the present study is the same as the 2018 Japan Report Card, because it was the most recent national data available. All 49 countries in the Global Matrix 3.0 had an average of a D⁺ grade in 2018.⁵ On December 2021, JSA reported the results of the screen time only on weekdays during the COVID-19 pandemic (from April to July 2021). Forty-two % of 10 to-11 year-olds and 31% of 13 to-14 year-olds spent less than 2 h per day on a screen. The reported prevalence of spending less than 2 h per day on a screen on weekdays in the 2017 survey was 54% and 44%, respectively.²³ Thus, the prevalence on weekdays in 2021 was more than 10 points worse than in the 2017 survey. The continued surveillance of screen time of Japanese children and adolescents is a public health priority, because under the GIGA School Initiative by MEXT, 1 screen-based device per student, with a high-speed network in schools, was provided in primary and junior high schools nationwide by the end of March 2021.²⁴ This may have an impact on leisure time screen time in the near future. Moreover, the proportion of myopia in children and adolescents in Japan is increasing.¹³ It is also necessary to focus on total screen time screen time, other than just screen-based leisure time.

4.6. Physical Fitness

The grade was B. The JSA survey comprehensively measures physical fitness and motor skills by gender in Japanese 6- to 19-year olds every year.¹² However, there are no Japanese government recommendations for physical fitness and criterion-referenced standards for physical fitness and motor skills. In the present study, we evaluated 20-m shuttle run (laps), standing long jump, grip strength and 30 s sit-ups centiles by age and sex in Japanese children and adolescents aged 9- to 17-year-olds years in the Tomkinson et al.²⁵ The mean values were 84th, 76th, 42nd, and 77th centiles, respectively.¹² The average value of the four measurement items was 70th centile. This indicator had previously received a grade of A on the 2018 Japan Report Card due to an evaluation based on only 20-m shuttle run (speed (km/h) at the last complete stage) centiles by age and gender in children and

adolescents aged 9–17 years according to the criterion-referenced data provided by Tomkinson et al.²⁶ Based on the normative values published by Tomkinson et al.,²⁶ the average values of 20-m shuttle run (laps) were 84th centiles in both 2018 and 2022.

4.7. Weight Status

Weight Status was evaluated based on the prevalence of obesity (8.68%) and thinness (2.33%) in the database of the MEXT School Health Survey in 2019.¹³ Overall levels of obesity are high compared to the 1980s in Japan. The indicator of weight status in the 2022 Japan Report Card was assigned A. The prevalence in the 2022 Japan Report Card were similar with the 2018 Japan Report Card.⁷

4.8. Sleep

This new indicator for the Japan Report Card was graded D⁻. Sleep was evaluated based on the National Sleep Foundation's sleep time duration recommendations.²⁷ Twenty-four percent of 14- to 15-year-olds meet the recommendation, that teenagers spend 8–10 h of sleep per day. The D⁻ grade of sleep was lowest grade compared other indicators in the 2022 Japan Report Card. In 2019 JSA also reported the 24% of 14- to 15-year-olds met the recommendation.¹¹ Mindell et al.²⁸ which reported cross-cultural differences in infant and toddler total sleep time showed that Japanese had the shortest sleep times. In addition, Takahashi et al.²⁹ reported that Japanese preschoolers exhibited shorter sleep times than Chinese preschoolers. Another study also showed that for university students, Japanese time spent sleeping was significantly less than European Canadians.³⁰ Moreover, Asian Canadians' sleep behaviors were largely similar to European Canadians suggesting that people acculturate to local cultural sleep norms. The unfavorable grade of the sleep indicator might therefore be due to the influence of Japanese lifestyle and social environment in relation to sleep.

4.9. Family and peers

The grade was C⁻. There are no Japanese government recommendations for exercise or sport with parents for children and adolescents. Thus, as in 2018, the grade was based on the prevalence of participation in sport and exercise with their guardians (31%), the frequency with which they were encouraged by their guardians to exercise or play sport (52%), sport participation for Japanese adults (20%) and their healthy weight status (65%).^{8,10,14} Data on participation in sport or exercise with a guardian in the 2022 Japan Report Card uses the same survey year's data as the 2021 Japan Report Card because the question wasn't asked in the recent JSA survey.¹¹ Other percentages remained stable. Thus, the grade C⁻ for this indicator was the same as in 2018. In Japanese primary school children, MVPA in the children was significantly positively correlated with maternal MVPA and support for children.³¹ However, paternal MVPA and support showed no significant association with MVPA in children. Thus, continuous nationally representative survey on participation in sport and exercise with guardians is needed. The Second Basic Plan for Sport for the period April 2017 to March 2022 by JSA tried to improve the percentages of sports participation, particularly among females in their 20s and 30s.³² However, the percentage of the female sports participation (16.9%) was slightly lower than that of previous national survey (19.0%) in the 2018 Japan Report Card, although male sports participation remained stable (23.9% in 2018, 23.5% in 2022).¹⁴ Recent previous studies reported that barriers to participation in sport differ between mothers and fathers or childless females in Japan.^{33,34} Thus, further research into PA or sports participation among Japanese mothers and fathers is also needed.

4.10. School

The grade for School in the 2022 Japan Report Card remained consistent with the 2018 Japan Report Card at a B⁺. The Japanese government sets the curriculum in primary school, junior high school, and high school, including the content of PE and the number of PE classes (100%) provided. According to the curriculum, all schools have recess time (100%). The MEXT produces guidelines for school infrastructure and equipment (100%) for PE or active play, such as the area of the school playground and the existence of a gymnasium and relevant equipment according to the education guidelines (eg, sports mat, horizontal bars, hurdles, etc). The Second Sport Basic Plan showed the importance of physical education (PE) in primary schools being carried out by PE specialist teachers.³² However, the percentage of PE classes in primary schools taught by PE specialists with a university degree in that field was low and unchanged (only 5%).¹¹ Also, in primary schools, PE classes are the only classes in Japan that don't use textbooks (67%).

4.11. Community and Environment

The grade B for Community and the Built Environment in the 2022 Japan Report Card was an improvement on the B⁻ in the 2018 Japan Report Card. Health Japan 21 (second term) sets targets for the number of local governments trying to provide environments that were easily accessible for residents to exercise.³⁵ Although the number of prefectures fulfilling the conditions increased from 30 prefectures, used in the 2018 Japan Report Card to 34 prefectures, used in the 2022 Japan Report Card, this is still below Health Japan 21 (second term) target of all 47 prefectures.

4.12. Government

The grade for Government Strategies and Investments remains unchanged from the 2018 Japan Report Card at a B given that no new data were available to inform a change to the previous grade. As in the 2022 Japan Report Card, the grade was also assigned based on relevant national laws, ordinances, and the “presence” of strategies, and policies in Japan like the 2018 Japan Report Card.⁷ Based on an analysis of assigned grades from 49 countries participating the 2018 Report Card initiative, a mean letter grade in 2018 was C and the grades ranged from F to A.⁵ There are official national guidelines for PA preschool children aged 3-to-5 years old by the MEXT and PA for adults and elderly by the Ministry of Health, Labour and Welfare.^{36,37} However, guidelines for PA school-aged children and adolescents in Japan, have yet to be drawn up. Although “the development of environments supporting PA” is one of the targets of Health Japan 21, the ambiguity of the criteria is an issue to be addressed in the future.³⁵

4.13. Strengths and limitations

The major strength of the 2022 Japanese Report Card is the use of nationally representative data to assign grades. However, there is a major surveillance gap in Japan, as it is not possible to grade Active Play. For several indicators, there was limited data for fifth- and eighth-grade students. In addition, due to COVID-19, the latest national survey data for 2021 were not available and suitable for the preparation of the 2022 edition, and the 2022 edition reflects pre-COVID conditions in Japan. Furthermore, some of the data used to derive the grades for the 2022 edition of the Japanese Report Card have not been studied continuously and are several years old, making it difficult to estimate recent trends and current conditions. Lastly, the grading system for influences on health behaviors (4 indicators) is more ambiguous than other indicators, which should

be improved in the next report card.

5. Conclusion

The 2022 Japan Report Card shows that Japanese children and adolescents had favorable levels of active transportation to and from school, and weight status just before the COVID-19 pandemic. Japanese children and adolescents had unfavorable levels of recreational screen time and sleep. Japanese children and adolescents grow up in an adult environment with low sport participation, but an otherwise favorable environment for PA. Moreover, for the first time, the present report card revealed a grade of overall PA, but the grade was not favorable level. Future nationally representative surveys on active play are needed, with continued surveillance of overall PA, active transportation, screen time and influence of family of Japanese children and adolescents.

Author statement

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Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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