

# Results From South Africa's 2022 Healthy Active Kids' Report Card on Physical Activity, Body Composition Proxies, and Nutritional Status in Children and Adolescents

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**Background:** Physical activity (PA) and nutrition in children have an impact on overall physical and mental well-being, cognitive, and social development. This study aims to report on the best current available evidence on PA, body composition proxies, and nutritional status of South African children and adolescents, based on the published findings between 2018 and 2022, which comprise the 2022 Healthy Active Kids South Africa Report Card. **Methods:** A comprehensive literature search of online databases, along with hand searching and a gray literature search, was conducted based on PA, body composition proxies, and nutrition indicators defined, in part, by the Active Healthy Kids Global Alliance. **Results:** Compared with the 2018 report card, there was an improvement in the majority of PA indicators which include overall PA (B–), active transportation (B–), physical fitness (B–), and government policy and programs (C). Body composition proxies and most of the nutrition indicators remained unchanged. The indicators that regressed from 2018 to 2022 included community and environmental influences (D), as well as participation in organized sport (D–). **Conclusions:** Despite the apparent improvement in overall PA levels in children and adolescents, there is a lack of tangible evidence of actual implementation of policies and programs. There was also a lack of nationally representative data for most indicators. Overall, there is a need to identify intersectoral, equitable approaches for promoting PA and healthy eating in South African children and adolescents and ongoing monitoring and surveillance.

**Keywords:** overweight, obesity, early childhood, community, school

## Key Points

- Physical activity in South African children is improving.
- Nutritional status still requires attention, which could subsequently improve the body composition proxies.
- In addition to ongoing monitoring and surveillance, it is recommended that intersectoral, equitable approaches be identified for further promoting physical activity and healthy eating in South African children.

Physical activity (PA) has a number of physical and mental health benefits in children and adolescents,<sup>1</sup> including improved

attention, academic performance,<sup>2</sup> and cognitive function.<sup>3,4</sup> Furthermore, consistent participation in PA by children and adolescents, be it through unstructured play, organized sports, dance, or simply through their daily commute, is linked to the various developmental advantages, which include essential motor skills, and improved socialization.<sup>5</sup> Current guidelines suggest that an average of 60 minutes of daily PA at moderate to vigorous intensity is appropriate for children and adolescents aged between 5 and 17 years to achieve health benefits,<sup>6</sup> and that at least 180 minutes of PA at any intensity for younger children (1–4 y) is recommended. Regarding infants, at least 30 minutes of “tummy time” along with PA through active play several times a day is recommended.<sup>7</sup>

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Having access to and consumption of nutritious food also plays a significant role in improving overall health by reducing the risk of chronic diseases, underweight and overweight, and obesity, not only among children and adolescents, but tracking across the life course. Additionally, chronic malnutrition causes half of childhood deaths in South Africa.<sup>8</sup> Adequate and healthy dietary intake plays an important role in the growth and development of children. However, >50% of South African children lived below the poverty line in 2020,<sup>8</sup> and the South African National Health and Nutrition Examination Survey study found that only 41% of households with children and adolescents are food secure.<sup>9</sup>

The Healthy Active Kids South Africa (HAKSA) Report Cards have been compiled every 2 to 4 years, since 2007 (2007, 2010, 2014, 2016, and 2018).<sup>10–12</sup> Each has provided a comprehensive summary of the best available, most current, peer-reviewed evidence pertaining to prevalence of, and factors, and policies that may influence PA, body composition proxies, and nutritional status of South African children and adolescents. The present review, upon which the 2022 HAKSA Report Card was based, was conducted in accordance with the Active Healthy Kids Global Alliance (AHKGA) methodological guidance.<sup>13</sup> South Africa was one of >50 countries, spanning 6 continents, that participated in the Global Matrix 4.0.<sup>14</sup> The aim of the 2022 HAKSA Report Card was to consolidate evidence on 10 PA and health indicators pertaining to children and adolescents (overall PA, organized sport participation, active play, active transportation, sedentary behavior, physical fitness, family and peers, school, community and environment, and government). In the South African edition, data on nutritional status (indicated by factors such as underweight and stunting) and body composition proxies (overweight/obesity) were also included, as well as the best available evidence related to early childhood. The body composition proxies and nutrition indicators were added over the 10 traditional physical indicators because nutrition plays an important role on the overall health, with the type of food consumed affecting the body composition proxies, which affects the overall health.<sup>8</sup> Additionally, with the majority of the households in South Africa experiencing food insecurity,<sup>9</sup> it was necessary to take the nutrition indicators into account. A key remit of the HAKSA Report Cards in South Africa has been their use as advocacy tools. These report cards are instrumental in informing the development of policies, programs, and interventions that aim to enhance opportunities for safe and enjoyable PA while also improving access to affordable and healthy food for children and adolescents.<sup>10–12</sup>

In the 2018 HAKSA Report Card, it was estimated that about half of South African children and adolescents met the global recommendations for overall PA.<sup>15</sup> However, at the same time, nearly one-third of children were not participating in regular, school-based physical education (PE).<sup>16</sup> It was further reported that there is a gap between the existing policies and the actual implementation of these policies.<sup>15</sup>

In the 2018 report, only one out of 5 schools met the recommended servings of fruit and vegetables.<sup>17</sup> South African children ranging from 9 to 11 years of age had the highest intake of sugar-sweetened beverages (SSB) in a 12-country study, with highest prevalence noted in children from low economic groups.<sup>18</sup> This study was conducted in 12 countries with a range of economic and human development (Australia, Brazil, Canada, China, Colombia, Finland, India, Kenya, Portugal, South Africa, the United Kingdom, and the United States). Furthermore, it was reported that the majority of children spend over 3 hours on their screens per day, excluding the time doing school work.<sup>18</sup> Additionally, only a third of children devote the recommended amount of time for their age group to screen time.<sup>19,20</sup> Furthermore, overweight/obesity was reported to have increased among South African children and adolescents, especially among girls.<sup>21</sup>

The aim of the present study was 2-fold. First, this study aimed to report on the systematic review of evidence from which the HAKSA 2022 Report Card was compiled regarding the state of PA, body composition proxies, and nutritional status of South African children and adolescents. This work and the respective indicators used were undertaken in alignment with the AHKGA, Global Matrix 4.0.<sup>13</sup> The second aim of this study was to compare the results of the 2018 report card with the results of the 2022 report card. The 2022 report card was the first report card issued following the COVID-19 pandemic. This could have an impact on participation trends in PA; hence, it is important to compare the changes that might have taken place due to the COVID-19 pandemic.

## Materials and Methods

### Indicators

The PA indicators assessed included: overall PA, organized sport participation, active play, active transportation, sedentary behavior, physical fitness, the influence of: family and peers, schools, the community, and the environment, and government. The nutrition and body composition proxy indicators included: fruit and vegetable intake, snacking, intake of SSBs, fast food intake, school tuck shops contents and policies, vegetable gardens, the National School Nutrition Programme (subsidized school feeding), food security, advertising and media, overweight/obesity, and undernutrition. The early childhood indicators included: overall PA, motor proficiency, dietary intake, malnutrition, overweight, and obesity, as well as sedentary behaviors.

### Search Strategy

An extensive search was conducted using databases including PubMed, CINAHL, Web of Science, and Google Scholar for peer-reviewed literature published from January 2018 to May 2021 ([Supplementary Material](#)). The literature search was limited to South African children and adolescents (3–18 y old).

Exclusion criteria included (1) review articles, (2) studies published and included in the previous HAKSA Report Card, (3) studies conducted outside of South Africa, (4) studies with participants exclusively over 18 years, (5) studies with data collected earlier than 2015, and (6) studies not published in English. Hand searching and a gray literature search were additionally conducted for policies and programs related to ecological and contextual factors that may influence PA. After the initial search, titles and abstracts were examined and articles found to not meet the search criteria, were duplicates, or did not provide information about any of the indicators were excluded. The remaining articles were then additionally considered for full-text extraction.

### Data Extraction

Academics from 10 South African tertiary academic institutions were invited to form a scientific advisory group (19 members), some of whom had previously participated in developing the 2018 HAKSA Report Card. Groups were formed according to the different indicators. A group leader was selected for each group. Complete manuscripts of the studies included for consideration were distributed among the group members, to evaluate for inclusion, key methods, and findings relevant to the indicator. The group leaders conducted cross-checking of the extracted data, where

necessary (eg, when there were disagreements among group members). Data quality scoring was conducted using the Mixed Methods Appraisal Tool (version 2018), and data extraction was completed and shared on an Excel spreadsheet. Mixed Methods Appraisal Tool is used to determine the quality of the studies reviewed by screening the methodology used in an article, including assessing the research questions and data collected. The researchers in each group independently reviewed the journal articles and indicated whether the methodology met the quality criteria outlined in the Mixed Methods Appraisal Tool guidelines and checklist.

Against each indicator, and for each document that met the inclusion criteria, full-text extraction included the following information: study population or target group, intervention or policy, the methodology, and key findings or outcomes. Where quantifiable data were easily summarized and available, they were captured as part of data extraction. In collaboration with team members, group leaders assigned provisional grades for each indicator, which were presented to the co-principal investigators.

The grades for each indicator are based on the AHKGA schema<sup>13</sup> and were interpreted as in Table 1. This benchmark for grading was also used for the additional nutrition and body composition proxy indicators. Grades were verified, and consensus was reached based on the study representativity, sample size, and geographic distribution. Justification for each grade was benchmarked according to the Global Matrix 4.0 indicators, as above, and a summary of the rationale for the grades assigned was provided. Provisional grades were sent for auditing by the AHKGA,<sup>13</sup> after which any final adjustments were made in collaboration with group and project leaders.

This study did not require institutional ethics approval as all information was available in the public domain and already deidentified. The study was registered on the International Prospective Register of Systematic Reviews (PROSPERO ID: CRD42021256375).

**Table 1 Interpretation of the Grades for the Indicators**

| Grade | Interpretation  |
|-------|---|
| A+    | 94%–100%  |
| A     | We are succeeding with a large majority of children and youth (87%–93%)     |
| A–    | 80%–86%   |
| B+    | 74%–79%   |
| B     | We are succeeding with well over half of children and youth (67%–73%)       |
| B–    | 60%–66%   |
| C+    | 54%–59%   |
| C     | We are succeeding with about half of children and youth (47%–53%)           |
| C–    | 40%–46%   |
| D+    | 34%–39%   |
| D     | We are succeeding with less than half but some children and youth (27%–33%) |
| D–    | 20%–26%   |
| F     | We are succeeding with very few children and youth (<20%)                   |
| INC   | Incomplete insufficient or inadequate information to assign a grade         |

## Results and Discussion

The database search yielded 218 articles, of which automation tools removed 100, as well as 5 duplicates. A total of 100 articles were screened by title and abstract, after which 41 were subsequently assessed for eligibility. After assessment, 11 articles were included in the review from online databases. Additionally, 19 articles were identified by hand searching and the gray literature search, yielding a total of 30 sources that were finally included in the review. A Preferred Reporting Items for Systematic reviews and Meta-Analyses diagram in Figure 1 summarizes how the sources were identified.

The majority of the results were based on smaller regional studies due to a lack of national data for the indicators of interest. Table 2 summarizes the grades awarded for each respective indicator. For reference, the grades are presented alongside the 2018 HAKSA Report Card to indicate progress or lack thereof.

Results suggest an improvement in the overall PA of children and adolescents in South Africa since 2018. The results also indicate that there are existing policies and financial resources in place to encourage PA in South African children and youth. However, only a few nutrition indicators improved from 2018 results, and there seems to be no change in the prevalence of overweight and underweight in early childhood, children, and adolescents.

### Children and Adolescents

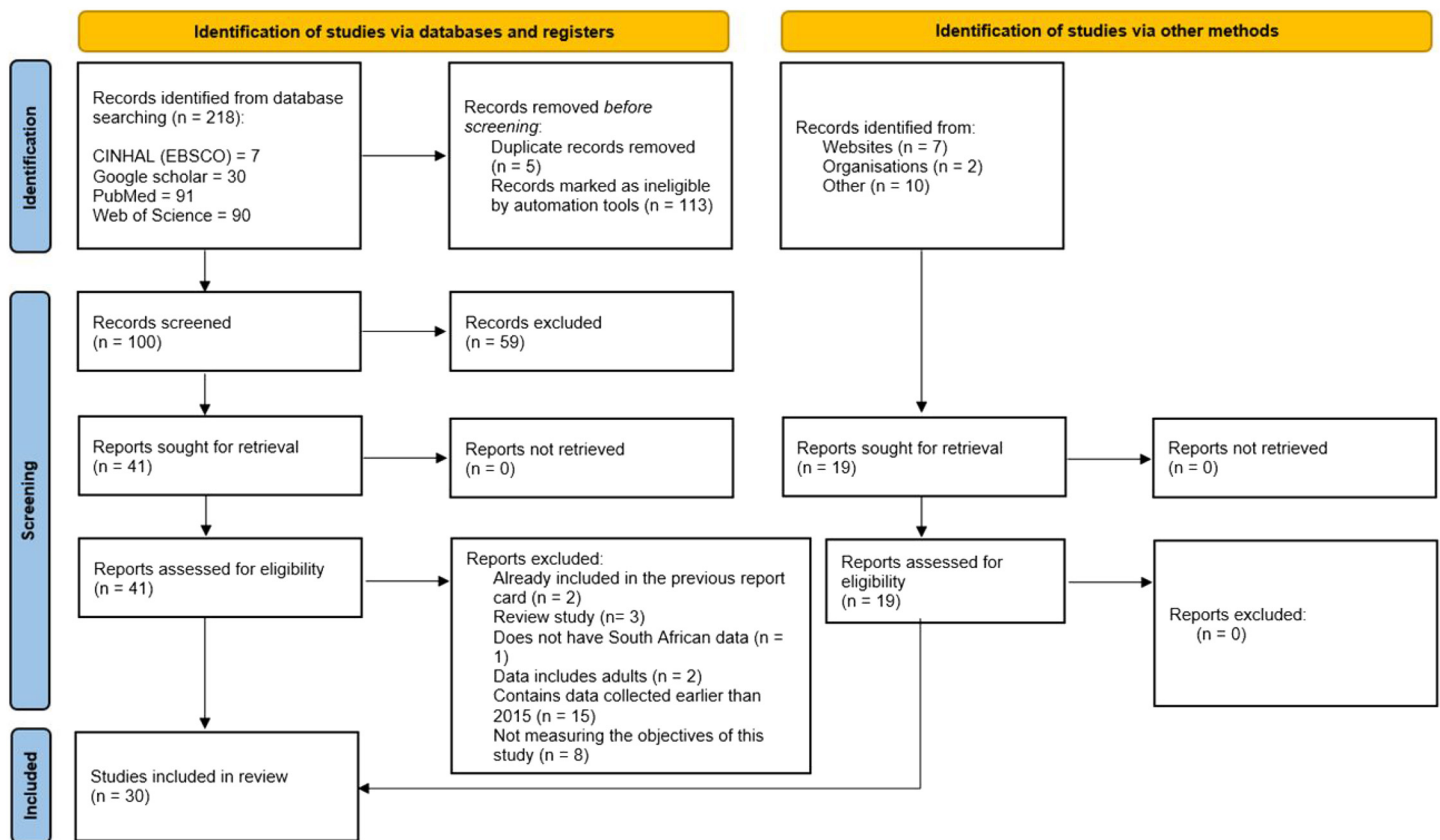
#### Overall PA: B–

There are no current national data on overall PA levels in South African children and youth. One recent regional study on PA in primary school learners from disadvantaged schools found that 27.5% of the study participants were not meeting recommended PA levels.<sup>22</sup> This study was conducted on 832 children between 8 and 12 years of age, with self-reported PA measured with the Health-Behavior of School-aged Children test. In this study, the level of PA was determined by inquiring about the number of days the participant engaged in at least 60 minutes of PA over the past week. Based on their responses, participants were categorized into 3 levels of PA: low, moderate, and high. Specifically, those who reported being active for 0 to 1 days per week were classified as having low PA, those active for 2 to 5 days per week were classified as having moderate PA, and those active for 6 to 7 days per week were classified as having high PA. In another study, an analysis of 650 school children from disadvantaged communities found that 40.8% were not meeting PA recommendations, while approximately 60% to 73% of children were found to be following the PA guidelines.<sup>23</sup> The lack of resources in disadvantaged communities could be a contributing factor to children not participating in PA. A grade of B– was therefore recommended, which marked an improvement compared with the C grade assigned in 2018.

#### Organized Sport Participation: D–

While there is limited evidence concerning participation in organized sport among South African children and youth, one recent study followed a longitudinal cohort of 1337 children from 12 to 18 years of age, from a disadvantaged community in South Africa. Researchers found that 82% of the boys reported consistently low levels of participation in organized sports, both at ages 12 and 18 years (less than the median of 186 min/wk). In the girls, 89% reported no participation in organized sport between 12 and 18 years old.<sup>24</sup> While this sample is not nationally representative,





**Figure 1** — Preferred Reporting Items for Systematic reviews and Meta-Analyses diagram summarizing how sources were identified.

it reflects the lived experience of a relatively large sample of South African youth. For this reason, a conservative D– grade was allocated. This grade is lower compared with the 2018 grade. More data are needed to corroborate self-reported organized sporting activity.

#### **Active Play: INC**

There is insufficient evidence at present to allocate a grade for active play. However, several researchers are working in this area in South Africa. A recent study highlighted the importance of “street play” for South African children and youth, particularly those living in low-income settings.<sup>25</sup> In another study on parental perception regarding active play in South African toddlers, parents recognized the importance of PA and active play for their children, but major concerns for outdoor play included safety of the child and lack of resources.<sup>26</sup> Most mothers played in an unstructured way with their toddlers, for example, singing and dancing. This grade remains unchanged from the 2018 report card due to insufficient evidence.

#### **Active Transportation: B–**

Active transportation has been reported to have decreased globally.<sup>27</sup> In South Africa, the National Household Travel Survey of 2020 statistics indicated that 59.3% of all learners (total N = 17,044) walked to and from school.<sup>28</sup> A further 22% used some form of public transport (train, bus, and taxi), which still involved some walking to and from transport hubs. Of school-aged children (N = 14,108), 63% walked all the way to school, with a further 23% taking some form of public transport for at least a portion of

their journey. The primary reason cited for walking was because of proximity (76.9%) with schools being within walking distance. About 12% indicated that public transport was either too expensive or unavailable. However, only 6% indicated that they walked to school by choice, with 3% citing that they had no other means of transport.<sup>28</sup> Another study showed that more than half (57%) of the children surveyed walked to and from school.<sup>29</sup> It should be noted that this study was conducted in 2 low socioeconomic areas of Cape Town, and while localized, results align with those of the National Household Travel Survey 2020. Poor transport infrastructure and low accessibility in sub-Saharan Africa mean that a large section of the population utilizes active transport, not necessarily by choice.<sup>30</sup> With the seemingly increased percentage of children walking to school, this grade has improved from the 2018 report card.

#### **Sedentary Behavior: C–**

Sedentary behavior is defined as time spent before and after school watching television, reading, drawing, homework, playing musical instruments, playing video games, and internet surfing.<sup>24</sup> This was traditionally defined as screen time; however, there are other sedentary behaviors that have varying impacts on the different health outcomes. Therefore, these supplementary behaviors are also considered part of sedentary behavior, in addition to screen time. At present, there is only one study providing evidence of self-reported sedentary behavior in children and adolescents in South Africa.<sup>24</sup> The study followed a longitudinal cohort of children from 12 to 18 years of age, from a disadvantaged community in South Africa. For this study, high

**Table 2 Comparison of 2018 and 2022 HAKSA Report Card Grades**

| Indicator  | 2018 grade | 2022 grade |
|--|------------|------------|
| Physical activity                                |            |            |
| Overall physical activity                        | C          | B–         |
| Organized sport participation                    | D          | D–         |
| Active play                                      | INC        | INC        |
| Active transportation                            | C          | B–         |
| Sedentary behavior                               | F          | C–         |
| Physical fitness                                 | INC        | B–         |
| Family and peers                                 | C–         | C–         |
| School   | D–         | D–         |
| Community and environment                        | C–         | D          |
| Government                                       | C–         | C          |
| Nutrition and body composition proxies           |            |            |
| Overweight and obesity                           | D          | D          |
| Undernutrition                                   | C          | C          |
| Fruit and vegetable intake                       | D          | C–         |
| Snacking, SSBs, dietary sodium, fast food intake | F          | D          |
| School nutrition culture and environment         | D–         | D–         |
| National School Nutrition Program                | C          | C          |
| Food security                                    | D–         | B+         |
| Advertising and media                            | D–         | D–         |
| Early childhood                                  |            |            |
| Overall physical activity                        | A–         | B          |
| Motor proficiency                                | A–         | B          |
| Sedentary behavior                               | INC        | D          |
| Overweight and obesity                           | D–         | D–         |
| Malnutrition                                     | –          | C          |
| Dietary intake                                   | –          | C          |

Abbreviations: HAKSA, Healthy Active Kids South Africa; SSB, sugar-sweetened beverage.

sedentary behavior was defined as >2000 minutes per week (4.8 h/d). Researchers found that 78% of the boys reported low levels of sedentary behavior both at age 12 years and age 18 years. In the girls, 92% reported low levels of sedentary behavior at age 12 years which by age 18 years had increased to 2000 minutes per week.<sup>24</sup> While this sample is not nationally representative, it reflects the lived experience of a relatively large sample of youth. A conservative grade of C– was therefore allocated, as the sample is not nationally representative. The scoring was still based on AHKGA method, with high percentage of participants reporting low sedentary behavior regarded as “succeeding” (Table 1). There appears to be some improvement regarding the sedentary behavior among boys, while there is no improvement reported in adolescent girls, resulting in the allocated grade of C–. More data are needed on screen time and objectively measured sedentary behavior. The overall grade on sedentary behavior has changed from F to C– since 2018. It is important to note the limitation of lack of accuracy in the comparisons between 2018 and 2022 due to lack of representative data.

#### **Physical Fitness: B–**

The grading was based on one study of 746 children. The boys from low-income, disadvantaged communities were achieving

between the 50th and 60th percentile for shuttle run laps, and the girls were achieving between the 60th and 70th percentile.<sup>31</sup> The normative values for physical fitness in children and adolescents were based on the 2018 study.<sup>32</sup> This indicator was changed from “INC” in 2018 to B– in the 2022 report card.

#### **Family and Peers: C–**

The most recent data from a population-representative sample of South African adults (N = 26,339) suggest that 43.6% meet PA recommendations based on self-report.<sup>33</sup> In terms of parental support for PA, a recent manuscript characterized parental perceptions of child safety when walking to and from school.<sup>29</sup> Parents of children who walked to and from school (N = 359) from 3 schools in low-income communities in South Africa were surveyed, with >60% of parents feeling uncomfortable about their children walking to and from school. Over half of the children in the study were not supervised, and it was observed that the level of supervision decreased as the distance to the school increased.<sup>29</sup>

In another study, 2 groups (SP—sports participation N = 208 and NSP—non-SP, N = 30) were identified. There were significant differences between the SP and NSP groups of boys in terms of support.<sup>34</sup> Those boys who participated in sport indicated that they had someone who provided transport to their training or

sporting events. Between 45% and 49% of SP boys indicated that someone told them they are doing well in their sport or PA “often” or “sometimes.” Of the NSP boys, 57.1% indicated they were never told they were doing well. Additionally, SP boys were more likely to have friends participating in sports with them often or every day, compared with the NSP boys. No differences were found between the SP and NSP girls, except that 91% of the SP girls indicated that someone comes to watch them participate in PA or sport often, or every day. Conversely, only 61% of NSP girls indicated that someone comes to watch them participate often, or every day.<sup>34</sup>

Considering adult physical inactivity prevalence, parental attitudes toward active travel to and from school, and social support for sports and PA participation in adolescents, a C– grade was allocated. This grade indicates that South Africa is succeeding in supporting just less than half (40%–46%) of our youth through explicit modeling and support. There is a need for more nationally representative data and ongoing surveillance. This indicator remained unchanged from the previous report card published in 2018.<sup>15</sup>

#### **School: D–**

Information concerning the percentage of South African schools with active school policies is difficult to source. The National Department of Basic Education has an existing school policy for public schools, with PE being part of the curriculum, under the subject referred to as Life Orientation. However, there is no indication of implementation and review of this policy because not all schools are reported to participate in the PE curriculum. The national PE curriculum is allocated 2 hours per week in the foundation phase, and 1 hour per week in the intermediate and senior phases.<sup>35</sup> Independent Schools in South Africa, or private schools, do not appear to have a policy, but some selected schools have their own policies. However, the implementation in these schools has also not been measured. Recent studies have reported on formal structured PE being offered at schools nationwide. However, participation rates are low, particularly in low socioeconomic regions/schools. Seventy percent of schools have formally structured PE. However, <80% of children are taught by a PE specialist.<sup>35</sup> PE is mainly taught by nonspecialist classroom teachers (62.3%), with 21.5% by specialist educators and 14.9% outsourced. Teachers state that the major challenges include curricular constraints, lack of content knowledge, budgetary constraints, didactical competencies, and a lack of facilities and equipment.<sup>35</sup> The reason for the lack of specialist PE in public schools may in part be attributed to the phasing out of teacher-training colleges of education in the early 2000s.

South African schools are classified according to a funding model that creates 5 categories of schools, called quintiles. These quintiles determine how much the government will fund each school yearly. The schools in the lower quintiles (1–3) are declared no-fee schools and do not charge school fees, while schools in quintiles 4 and 5 are fee-paying schools. Quintile 1 school participation in PE is low, 40.2% and 42% in primary and secondary schools, respectively.<sup>36</sup> Participation in PE in quintiles 2 and 3 was 60.2% and 32.6% in primary and secondary schools, respectively, with quintiles 4 and 5 having the highest participation rates with 80.1% and 66.1% in primary and secondary schools, respectively.<sup>36</sup> While it is mandated in the curriculum document, the PE period is often not utilized for formal PE. PE is being implemented in 40% to 42% of the primary and secondary quintile 1 schools, indicating that the lower income schools are at a clear disadvantage. Efforts and commitments from the government to advocate and establish quality PE are present, but no

major curriculum or policy changes have resulted. The grade has remained unchanged from the 2018 report card.

#### **Community and Environment: D**

One of the clear innovations promoting PA through active travel is the “Walking Bus” project, although this is isolated to 1 Province.<sup>37</sup> This program has been implemented successfully since 2016 in the Western Cape Province and currently involves community members from at least 70 different areas. Parents and volunteers from the broader community walk groups of children to school in the morning and back home in the afternoon aiming to improve learner safety. Walking Bus volunteers receive training on various aspects, including conflict resolution. They are provided with jackets, stop signs, and in some cases, 2-way radios.<sup>37</sup> From 2019, these volunteers also received a nominal ZAR 2000 stipend (106.66 USD).<sup>38</sup> This was not specified if it was a once off stipend or monthly over a specific time period.

There are numerous examples of community engagement with local government, particularly around access to safe and inclusive public open and green spaces. One example is a project conducted in Johannesburg to transform the “End Street North Park,” which was a public park characterized by vandalism, neglect, litter, and criminal and illegal activities, and was perceived to be an “undesirable space.”<sup>39</sup> Over several years, the park has transformed, involving multiple local government departments, including public safety, nongovernmental organizations such as UN-Habitat, community members, local businesses, and other community organizations. Using stakeholder mapping, community engagement, safety audits, and development of partnerships, a blueprint of best practice was created. Key features of success were committed leadership and community buy-in, as well as alignment with local government vision and deliverables.<sup>39</sup>

Another area of consideration is sport for development, defined as the “use of sport policies, programs and projects to achieve development and peace outcomes beyond the playing field.” In a recent systematic review, 44% of sport for development programs in South Africa focused on community development, and a further 25% were directed toward improved mental health and well-being.<sup>40</sup> These programs largely address vulnerable youth, providing structured SP and life skills, as alternatives to riskier behaviors.

However, disaffected youth in the Western Cape and Gauteng provinces and local government officials in the North West province each highlight a different perspective.<sup>41</sup> Youth who were interviewed indicated that there was a lack of well-maintained and accessible recreational facilities, that they felt excluded from recreational activities, and that gangs and other undesirable elements often appropriated available facilities. There was also a sense that those existing facilities did not meet the needs or preferences of the community.<sup>41</sup> On the other hand, a survey of 20 officials in the North West province, responsible for managing recreation at a local government level, found that these individuals were not responsive to the community needs, and it remained an outdated paradigm.<sup>42</sup> Moreover, it seems that there is a lack of community engagement, the recruitment and motivation of a cadre of community volunteers, with little monitoring and evaluation, as well as a lack of sufficient funds to represent recreational activities.<sup>42</sup> This is a “mixed bag” of some community initiatives, some local government, NGOs, and community partnerships. However, the perception of a lack of safety remains. Moreover, disaffected youth and local government officials reflect a lack of community engagement and the planning and upkeep of community recreational facilities. As such, a D grade

was allocated, indicating succeeding with less than half of community programs focusing on promoting physical activity in children and youth (27%–33%). This is a downgrade from the 2018 report card.

### **Government: C**

Various governmental departments have provided ongoing support, specifically financial support. There is continued leadership and commitment regarding PA opportunities for children, including building outdoor gyms and cycle lanes.<sup>43</sup> Funds have been allocated to build recreational facilities through the country,<sup>44</sup> and it seems that there is also continued support from the national government for school sport leagues.<sup>45,46</sup> Furthermore, it seems that some progress with policy development, specifically considering the COVID-19 pandemic, has been seen. However, evidence of policy implementation and evaluation is limited. The previous score in the 2018 report card was a C–. A slightly higher grade of C was allocated in the 2022 report card, as the government's leadership and commitment in the provision and opportunities and policy development for PA for children and youth are ongoing. The implementation and evaluation of such programs continue to be a challenge.

### **Overweight and Obesity: D**

No current national studies were reported for overweight and obesity levels among children and adolescents; however, several were done regionally. Okeyo et al<sup>47</sup> reported that, among 8- to 12-year-old children, 9.9% of males and 36% of females were overweight (body mass index in the 85th percentile) and have obesity (body mass index in the 95th percentile). Another study reported that among 14- to 19-year-olds, overweight and obesity among girls ranged from 14.3% to 38.4%, while in boys it ranged from 0% to 20%.<sup>48</sup>

In a different regional study, it was reported that among 5- to 15-year-old girls, obesity ranged from 0% to 5.5% and overweight from 6.3% to 13.8% while for boys, overweight ranged from 8.9% to 10.3% and obesity from 1% to 2.5%.<sup>49</sup> Both regional studies highlighted that the occurrence of overweight and obesity was related to sedentary behavior and poor nutrition. Considering that no national studies were done, a grade of D remains.

### **Undernutrition: C**

Since 2016, no national study regarding undernutrition has been conducted in South Africa, and regional studies reported conflicting findings. One study conducted in a rural area reported that among 6- to 15-year-olds, 27% were underweight while 22% were stunted.<sup>50</sup> Another regional study reported that among 14- to 19-year-olds, 6.5% were classified as thin and 3.2% as severely thin.<sup>48</sup> A third regional study reported only underweight among 8- to 12-year-olds and that 5.5% were girls, while 13.3% were boys.<sup>47</sup> Gate et al<sup>48</sup> suggested that, although some improvements have been made in reducing undernutrition, increasing food prices and aftereffects of COVID-19 pandemic with regard to loss of income for many families, undernutrition remains a challenge in South Africa, especially among rural children and adolescents. This grade remained unchanged from the 2018 report card.

### **Fruit and Vegetable Intake: C–**

No national studies were conducted, but one regional study reported that 95% of the 8- to 12-year-old children ate 1 to 2

fruits per day on the National School Nutritional Program and 75% of the children added vegetables to their main meal.<sup>47</sup> However, in the same study, it was also reported that, among the rural children, 95% of the children only received 1 fruit a week and <6% of the children received a vegetable daily. The limited data seem to suggest that fruit and vegetable intake has improved and thus the upgrade from a D to a C–.

### **Snacking, SSBs, Salt, and Fast Food: D**

Previous national data (South African National Health and Nutrition Examination Survey) indicates that approximately 20% to 50% of children and adolescents consume unhealthy foods daily such as SSBs, processed food, fast/fried food, and salty snacks. However, the implementation of the 10% sugar tax since April 2018 on SSBs has yielded positive results, with one national study reporting a 7-fold reduction in SSB consumption.<sup>51</sup> The consumption of unhealthy food remains prevalent, but the reduction of SSB consumption indicates some improvement, and thus, the F grade in 2018 has been upgraded to a D.

### **School Nutrition Culture and Environment: D–**

National data are still limited; however, regional data from low-income schools reported that 59% of children bought food from vendors inside or outside the school, and only 12% brought food from home.<sup>47</sup> Interesting to note is that, even though this was in a low socioeconomic environment, 71% of the children brought money to school for food.<sup>47</sup> The food that was purchased consisted mostly of fast foods, sweet and salty snacks, fried foods, and sugary beverages. The findings reflect findings similar to the 2018 report card, and in the absence of national representative data, this grade remains a D–.

### **National School Nutrition Program: C**

In 2018, a C grade was assigned primarily because of the National School Nutrition Program. Unfortunately, no other national study was conducted after 2018. One regional study reported that 85% of the children received a meal daily.<sup>47</sup> It should be noted that in this study very low consumption of fruit and vegetables was reported. Further, children receiving breakfast and lunch had lower stunting and overweight/obesity prevalence compared with those receiving breakfast only. Due to the lack of national and other regional studies, the same grade of C is given.

### **Food Security: B+**

Data from the National Income Dynamics Study—Coronavirus Rapid Mobile survey indicate that food insecurity (lack of money to buy food) declined from 47% in April 2020 to 41% in October 2020 and 35% in March 2021, while household hunger declined from 23% to 17% over the same period, and child hunger remained around 15%.<sup>52</sup> Considering the continued increase in food prices and unemployment rates, we consider the most recent 2020 findings indicating that 74% to 79% of South Africans are food secured is an upgrade from D– to a B+ grade.

### **Advertising and Media: D–**

The implementation of the sugar tax in 2018 promised voluntary measures by various stakeholders in the beverage industry which included limiting the supply and advertising of SSBs to primary schools in South Africa. Currently, the only regulation of food marketing and advertising to children that exists is the South



African marketing to children pledge. Although a reduction of consumption SSBs was reported previously,<sup>51</sup> regional data still indicate noncompliance to this pledge with regard to advertising. A study reported that in 2017 Coca-Cola pledged to remove all advertising and branding from school premises; however, this company's products are still being sold in 54% of primary schools' tuck shops.<sup>53</sup> Due to the lack of mandatory regulation and non-compliance to voluntary pledges and self-regulation by the manufacturing industry, a grade of D- remains.

## Early Childhood

### Overall PA: B

The literature search revealed only a few articles where the data were collected after 2018. One study conducted in 2 provinces on children aged 3 to 6 years, from urban and rural areas, indicated that most of the children exceeded the recommended daily PA guidelines of 180 minutes. Furthermore, it was reported that these children spent at least 60 minutes a day in moderate to vigorous intensity activities.<sup>54</sup> Results from a study in Gauteng on 6- to 24-month-old children similarly indicated that 58% of the children met the PA guidelines,<sup>55</sup> with more boys (72%) than girls (42%) meeting the PA guidelines. However, this is lower than previously reported for older toddlers.<sup>15</sup> Another study conducted on 3- to 5-year-old children in Gauteng (Soweto) indicated that 83% of children met the PA guidelines.<sup>56</sup> Furthermore, another study conducted in Gauteng reported that only 36.8% of preschoolers and 18.7% of Grade R-learners were physically active during the day.<sup>57</sup> There is therefore limited recent and past data reporting on the PA levels in children under 6 years, and the grade needs as changed to read B from an A- in 2018.

### Motor Proficiency: B

Motor proficiency is an important aspect of gross motor skill development, and if this is developed early, it may have a positive impact on a child's SP, academic learning, and overall well-being.<sup>58,59</sup> Motor proficiency consists of 4 components, which are fine motor control, manipulation coordination, body coordination, and strength and agility.<sup>58</sup> The Bruininks-Oseretsky Test of Motor Proficiency 2 is used to evaluate motor proficiency, and a score of below average, average, or above average can be obtained based on the total motor proficiency score.<sup>58</sup> In the results of a study conducted in 2 provinces (in rural and urban areas), it was reported that 46.2% of children were in the average category, while 36.1% were between above average and the very superior categories for motor proficiency.<sup>54</sup> Another study conducted in a rural area indicated that 5- to 7-year-old children were in the average proficiency for their locomotor and object-control skills,<sup>60</sup> and that boys performed better with the object-control skills, while the girls performed better with the locomotor skills. A further study<sup>61</sup> conducted in an urban area indicated that the majority of the 5- to 6-year-olds' motor skills were average (representing the elementary phase of development) regarding the execution of the locomotor and most of the manipulation of fundamental movement skills. However, regarding the balance and kicking skills' execution, many children were still below average (representing the initial phase of development). Last, 1 article conducted in a low-income setting indicated that 88.5% of children between 3 and 5 years had well-developed gross motor skills.<sup>56</sup> Since there is still limited evidence particularly around the effect of different socioeconomic status situations, and because the majority of the children's motor

skill development was between average and below average and was not good as reported in 2018, the grade was changed from an A- (that was also part of Early Childhood PA) to a B.

### Sedentary Behaviors: D

The recently released 24-hour movement guidelines for preschool children in South Africa recommend <1 hour of screen time per day and not more than 1 consecutive hour/s of sedentary behavior.<sup>62</sup> With the limited data available, <40% of urban-dwelling preschool children were meeting sedentary guidelines, 8% meeting screen time guidelines, and only 5% meeting both.<sup>55</sup> In a study conducted in Gauteng (Soweto), on preschool and Grade R children, 69.9% of the time was spent doing sedentary activities.<sup>57</sup> The picture is very different for rural preschoolers, where only 17% were not meeting sedentary behavior guidelines.<sup>55</sup> It seems that South African children are still not meeting sedentary behavior guidelines, and thus, a D grade was assigned for this indicator.

### Overweight and Obesity: D-

Data from 4 provinces showed that the overweight and obesity prevalence has increased over the last few years. The prevalence for overweight (body mass index in 85th percentile) children under 6 years ranged between 8% and 15.7% and for obesity (body mass index in the 95th percentile) between 3.7% and 12.7%,<sup>48,54,55,60,63,64</sup> with, once again, children from urban (formal and informal areas) faring worse than in other settings. It also seems that more girls tend to be overweight<sup>48,60,63</sup> and have obesity.<sup>60,63</sup> With the evidence of prevalence of overweight and obesity in children, it was recommended that the grade remains the same, at a D-.

### Malnutrition: D-

In terms of early childhood malnutrition (that includes stunting, underweight, and wasting/thinness), the prevalence is on the increase, and in some provinces, almost half (47.5%) of the children under 5 years are stunted. Several studies conducted on children under the age of 6 years in 7 provinces of South Africa, considering urban and rural areas, indicated that children from rural areas are more affected by stunting/underweight/wasting than children from urban areas.<sup>48,63-70</sup> The data indicated that the prevalence for stunting ranged between 7% and 54.5%, underweight ranged between 0.2% and 32.3%, and wasting/thinness ranged between 2.1% and 4.1%.<sup>48,55,57,60,61,63-66</sup> It was also reported that boys were more affected by stunting than girls.<sup>48,68</sup> Furthermore, as food insecurity increases, so did the prevalence of stunting, with a strong link between food insecurity and undernutrition, as well as the low socioeconomic status of the mothers.<sup>71,72</sup> Due to an increase in the prevalence of stunting, wasting, and underweight from 2018 to 2021, the grade was lowered from the previous HAKSA Report Card from a C to a D-.

It was evident from articles reported on in the 2018 HAKSA report that nutrition plays an important role in the development of children. Even though the data were published before 2018, it is important to note that a low dietary diversity score leads to higher stunting and wasting prevalence in the preschool population.<sup>15</sup> It is therefore crucial to improve/reinforce nutrition education in the different settings where people work with preschoolers. Early childhood development centers have a crucial role in shaping and improving children's food preferences and dietary behavior.<sup>44,73</sup> A diverse range of food sources and choices play a crucial role in enhancing the nutritional well-being of children, alongside ensuring food security.<sup>70</sup> When



food insecurity rises, there is a corresponding increase in the prevalence of stunting and wasting as indicated by nutritional status.<sup>71–74</sup>

### Dietary Intake (Snacking, SSBs, Salt, and Fast Food): C

Limited studies have focused on dietary intake in children under 6 years.<sup>63,73,75</sup> One study,<sup>75</sup> conducted in 2 provinces, indicated that children between 3 and 6 years have energy and fat intake below the recommended estimated energy requirements (EERs). While the saturated fat and free sugar intakes in the age group 1–6 years were above the recommended EERs. Overall, this indicates that the diets of these children were not healthy, and the main food items that were consumed were refined. This diet is also high in salty snacks and sugary items, and low in fruit and vegetables. Lastly, this study reported that 71% of 3- to 6-year-old children's energy intake were below the EER, while 66% of 1- to 3-year-old EER intakes were above the norm. Another study,<sup>63</sup> conducted on 2- to 4-year-old children, indicated a higher mean energy intake than the EER, while 4- to 5-year-old children had a lower energy intake. The mean intake of carbohydrates was significantly higher for all age groups. There is still limited evidence on this indicator and no improvement since 2018 so the grade remains the same, at a C.

### Limitations

The main limitation of this study lies in the overall quality of the data used to determine the grades of indicators. There were inconsistencies in the accuracy of the sourced data, particularly with regard to robust data representative of the South African child and adolescent population groups. Second, the restrictions on movement and engagement with participants during the COVID-19 pandemic limited opportunities for PA data collection. Children and adolescents living in low-income settings in South Africa were particularly vulnerable to physical inactivity during the pandemic. Thus, given these limitations, it is important to highlight the urgent need for improving efforts to monitor the indicators.

### Conclusions

The evidence suggests that the overall PA, active transportation, and physical fitness in children and adolescents may be improving in South Africa. Further information is required pertaining to sedentary behavior. There seems to be no change in body composition proxies, as well as only a few indicators showing improvement in nutritional status. We found evidence of the policies and funding set in place to promote PA; however, there is little evidence on evaluation in the implementation of these policies, or impact on funding and resources. More research is required to independently measure implementation, reach, and effectiveness. The safety of the environment remains a concern for engaging in PA, including walking of children and adolescents to and from school, as well as engaging in community activities which promote PA, such as street play. More implementation in organized sport participation in schools is needed, with PE being taught by PE specialists. Finally, PA for optimal growth and development for children and adolescents in South Africa needs to be considered in relation to the food environment, food security, and body composition proxies. Our key recommendation is the need for a national youth fitness testing program conducted on a regular schedule, and the inclusion of youth in the co-creation of strategies to promote activity-supportive environments and access to affordable, healthy food. Furthermore,

a better surveillance of PA and nutritional status is required to improve the quality of the data.

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