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Exercising educational equity using California's physical fitness data: a call for more school physical fitness programs, data, and research

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Childhood obesity has risen and is one of the most important global problems of our time, and school physical education programs are the key to ameliorating it. In American schools, physical fitness scores have declined; yet, global, national, state, and local concerns for the overall health, physical fitness, and wellbeing of children are at an all-time high. The lack of safe and affordable options for physical activity coupled with the significant decrease in physical activity rates among most American children underscores the need for programs, data, and research on physical fitness in schools, where children spend a significant amount of their time. The purpose of this brief research report is to call the federal government and states to mandate physical fitness programs and to increase data collection capacity on physical fitness in schools. Subsequently, this study asks researchers to study physical fitness in schools in the U.S. to increase its importance to policy makers and educational stakeholders and advance our understanding of educational inequities in school physical fitness. As an example, using descriptive analyses, we have provided policymakers, educational stakeholders, and researchers with a first look at California's physical fitness data which shows how our findings complement prior literature as well as extend them. Implications for the research and practice are discussed.

KEYWORDS

physical activity, physical fitness and sport, adolescence health, California schools, educational equity, educational equity (finance), school physical activity, school physical fitness

Introduction

Childhood obesity has risen and is one of the most important global problems of our time, and school physical education programs are the key to ameliorating it (Briers et al., 2024; Ogden et al., 2020). The incidence of risk factors for cardiovascular disease, cancer, and Type 2 diabetes as well as physical inactivity, inappropriate body weight, and high levels of blood lipids in American children has greatly increased over the past 30 years (Lebrun-Harris et al., 2022; Li et al., 2006; Masanovic et al., 2020; Thompson et al., 2007). In American schools, physical fitness scores have declined (Azzarito and Solomon, 2005); yet, global, national, state, and local concerns for the overall health, physical fitness, and wellbeing of children are at an all-time high (Masanovic et al., 2020; Tomporowski et al., 2008). The World Health Organization (WHO) suggests the "need for a whole-of society response to achieve a paradigm

shift in both supporting and valuing all people being regularly active, according to ability and across the life course" (p. 6).

There is a shortage of safe, affordable, and appropriate physical activity programs and places in most countries for certain groups, including women, older adults, people with disabilities and chronic diseases, and underprivileged groups more generally (WHO, 2018). The lack of safe and affordable options for physical activity coupled with the significant decrease in physical activity rates among most American children underscores the need for programs, data, and research on physical fitness in schools, where children spend a significant amount of their time (Yuksel et al., 2020). In addition, remote learning resulting from the COVID-19 pandemic exacerbates the situation. As a result of remote learning, Nolan and Zbaracki (2023) reported that many students' body mass indexes increased while their muscular strength decreased due to a decreased level of physical activity and a less active lifestyle associated with remote learning. The purpose of this brief research report is to call the federal government and states to mandate physical fitness programs and to increase data collection capacity on physical fitness in schools. Subsequently, this study asks researchers to study physical fitness in schools in the U.S. to increase its importance to policy makers and educational stakeholders and advance our understanding of educational inequities in school physical fitness.

As an example, using descriptive analyses, we have provided policymakers, educational stakeholders, and researchers with a first look at California's physical fitness data which shows how our findings compliment prior literature as well as extend them. For our analysis, we selected California as the largest state in terms of enrollment in public elementary and secondary schools. Additionally, California has a very diverse student population from both a racial and ethnic perspective. California has approximately 5% of Black American students, 10% of Asian American students, 2.2% of Filipino students, 56.1% of Latin* American students, and about 20% of White American students (CDE, 2024a). In California schools, there are also a sufficient number of American Indian, Alaska Native, and Native Hawaiian students for data analysis purposes. We find that a typical school district with the highest percentage of students in the Healthy Fitness Zone has a predominantly White American or Asian American student body, relatively low rates of English language learners and socioeconomically disadvantaged students, and a lack of migrant, foster, and homeless students, while a typical school district with the lowest percentage of students in the Healthy Fitness Zone tends to have a predominantly Latin* American student population with a high percentage of socially disadvantaged students, English language learners, and homeless students. Related, in the vast majority of school districts, Asian American, Filipino American, and White American students perform better than the average student, while Latin* American, American Indian, Alaska Native, Native Hawaiian, and Pacific Islander students perform worse than an average student. Implications for the research and practice are discussed. We have organized this essay as follows: literature review, empirical strategy, discussion, and conclusion.

Literature review

Physical fitness in US schools

"Physical fitness is a multicomponent construct closely related to the ability to perform physical activity" (Aslan et al., 2019, para. 1). Despite the size and severity of outcomes due to a lack of physical fitness in the U.S., too few studies examine physical fitness test outcomes among schoolchildren because of a lack of available data and government failure to mandate and fund such programs. Considering the seriousness of these problems, creating and studying school-based physical programs is a vital task. It is an important health marker because physical fitness in children and adolescents leads to positive health outcomes in childhood and adulthood (Boraczynski et al., 2015; Dennison et al., 1988; Kao et al., 2020; Marttinen et al., 2018). Non-school related physical fitness studies often control for socioeconomic status and race and find that children from low-income families—especially the racially minoritized—are much more likely to be overweight, have obesity, and engage in unhealthy behaviors (Chomitz et al., 2009; Coe et al., 2013; Dusen et al., 2018).

Moreover, individual socioeconomic status as well as federal and state funding allocations have important implications for school fitness and academic performance. First, socioeconomic status is positively associated with physical fitness and academic outcomes. For example, in a 2013 study with 1,701 third-, sixth-, and ninth-grade students from 5 school districts, Coe et al. (2013) found that "sixth-and ninth-grade students with high fitness scored significantly better on Math and Social Studies tests compared with less fit students. Lower SES students scored significantly worse on all tests. Muscular strength and muscular endurance were significantly associated with academic achievement in all grades" (p. 1). Similar results have been found globally, in the U.S., at the school level (Coe et al., 2013; Hanson and Chen, 2007; Johnston et al., 2007). A study conducted by Marrero-Rivera et al. (2024) concluded that physical activity and physical fitness are associated with positive cognitive and academic outcomes in Latin* students. Further, because of racial and economic segregation in American schools, there is concentrated poverty surrounding and impacting schools and their access to resources like physical fitness programs; such that, schools with more affluent students and White American students have greater physical fitness programs and sports clubs than schools with poor students and Black and Latin* American students (Johnston et al., 2007). The body of research linking socioeconomic status to physical fitness at the student and school level invites a macro level investigation of physical fitness and socioeconomic status at the district and state levels. Overall, finance plays a key role in driving and advancing our understanding of inequities in school physical fitness.

Several studies also identified a connection between socio-economic status and gender and socio-economic status and race/ethnicity. According to Lee and Lim (2022), male adolescents engage in physical activity more frequently than female adolescents. In addition, previous studies have demonstrated that adolescents from privileged families have a greater tendency to participate in physical activities than those from less privileged backgrounds. At the same time, compared to their counterparts, adolescents from higher socioeconomic families had smaller gender differences in out-of-school physical activities. A study by Fradkin et al. (2015) found that growing up in a high-socioeconomic status family, characterized by at least one member having a college degree, is associated with a lower risk of obesity among Latin* American and White American students.

Additionally, it is important to note that there is a difference in physical education standards across the country due to the impact that state-level professional organizations have on the process of development of the standards (Landi et al., 2021). The Society of Health and Physical Educators America (SHAPE America) is the national organization responsible for setting national standards and establishing grade-level

outcomes in physical education. Additionally, each state has its own professional organization (e.g., SHAPE Maryland, SHAPE North Carolina) that is affiliated with SHAPE America. The SHAPE America K-12 standards have been adopted by all state organizations, with the exception of one. State-level organizations directly influence physical education standards by typically recommending panel members when Departments of Education develop policies at the state level.

The decline of physical education programs in US schools

Despite the current trends in childhood obesity, a limited number of states in America mandate physical education (PE) for kindergarten through 12th grade students. In K-12, a quality PE program may be the best opportunity to engage students in meaningful physical activity. In contrast, recommendations continue to be made for the reduction or elimination of PE, so that more time and focus can be devoted to other academic subjects (Bass et al., 2013). Yet, school fitness has important implications for academic performance. For example, Bass et al. (2013) found that math and reading scores were 2.5–3 times higher among "boys in the Healthy Fitness Zone (HFZ) for aerobic fitness or muscular endurance. In the HFZ for aerobic fitness, [girls] were approximately 2–4 times as likely to meet or exceed reading and math test standards" (p. 832). Moreover, research shows that among children and adolescents physical activity interventions in schools can improve well-being and mental health, increase resilience, and, in turn, reduce anxiety (Andermo et al., 2020). Shafaei et al. (2024) found that increased physical activity is significantly associated with higher levels of social health, moral development, and physical fitness in children.

There are two main drivers of the decline PE programs, and consequently, a decline in physical activity among American schoolchildren. First is the reduction of economic resources available to schools. These financial predicaments worsen in poor communities of color who often have inadequate funding (Johnson et al., 2018; Skinner and Riddle, 2019). The second issue is that school performance on standardized academic achievement tests has become increasingly important, forcing schools to focus limited resources on classroom instruction to improve test scores (Castelli et al., 2007; Chomitz et al., 2009; Sallis and McKenzie, 1991). Conversely, schools do not have financial incentives to keep or expand physical fitness programs. Yet, research indicates that PE does not interfere with academic performance (Bass et al., 2013). Instead, physical fitness contributes to better test scores in multiple academic outcomes, indicating the importance of physical fitness to the learning process (Coe et al., 2013).

Research finds many well-known benefits of physical activity, yet numerous reports document sedentary living among most youth (McKenzie and Lounsbery, 2009). In a comprehensive review of 850 articles on the effects of physical activity on health and behavior outcomes and recommendations for change, Strong et al. (2005) recommended that "school-age youth should participate daily in 60 min or more of moderate to vigorous physical activity that is developmentally appropriate, enjoyable, and involves a variety of activities" (p. 732). In a global strategy to promote physical activity, the World Health Organization concluded that school is the best, most cost effective place to improve physical activity and education concomitantly (WHO, 2004). Despite the documented benefits of school physical fitness on education and physical activity, there is no requisite federal law mandating physical fitness in schools—and there is a general lack of federal (and state) funding to support physical fitness initiatives in school (McKenzie and Lounsbery, 2009).

Few states offer data on physical fitness test scores because it is not required, so there is a critical need for data and research on physical fitness in schools. Most studies on school physical fitness rely on self-reported physical fitness data (McKenzie and Lounsbery, 2009). There is a greater need for federal and state data sets to report on physical fitness test scores. Most research on physical fitness on schools comes from other fields besides education such as health sciences. As educational researchers are most familiar with school literature, problems, and practices, more educational research needs to be conducted. In the next section, we highlight state data from California by analyzing school physical fitness data from the 2018–19 school year.

Empirical strategy and discussion

This study analyzed the physical test results of school students in 5th, 7th, and 9th grades, who met the criteria for being in the Healthy Fitness Zone across all California school districts (CDE, 2020). California makes for an ideal case study because the state educates one tenth of U.S. children and has large scale school and district level data on physical fitness test scores. According to the California Department of Education, the Healthy Fitness Zone is "standards that were established by The Cooper Institute to represent a level of fitness that offers some degree of protection against diseases that result from sedentary living" (CDE, 2024b). As we analyzed the data, we paid particular attention to discrepancies in student performance by gender, race/ethnicity, and socioeconomic status, which may affect educational equity, see Appendix A for more information on the empirical strategy.

The results of our analysis compliment the discussion in the literature that low-income children—especially racially minorized—are more likely to be engaged in unhealthy behaviors (Chomitz et al., 2009; Coe et al., 2013; Dusen et al., 2018). One of the key observations from our study is the significant role of socioeconomic status on understanding students' physical performance. Across most California school districts, economically disadvantaged students consistently displayed lower levels of physical fitness than their more affluent peers—especially along racial lines with Latin* American and Native youth (American Indian, Native Hawaiian, and Pacific Islander) students performing in the lowest percentiles and White American or Asian American students performing in the highest. See Figure 1 for more information. Socioeconomic status plays a crucial role in the physical health of the students and might affect physical performance in several ways, including access to healthier and higher quality food options, availability of extracurricular physical activities and sections, and ability to afford to participate in school sports.

At the same time, in the vast majority of school districts, Asian and Filipino American students (73.2%) and White American students (71.3%) perform better than the average student. Latin* American (81.2%) and American Indian or Alaska Native and Native Hawaiian or Pacific Islander students (81.3%) perform worse than an average student in most California school districts. In our analysis, we find that students from those racial groups are more likely to not be in the Healthy Fitness Zone, which means that they will have a lower level of protection against diseases as adults. See Figure 2 for more information about the percentage of students in the Healthy Fitness Zone by race.

The results of this study cannot confirm or refute the notion that girls have fewer opportunities to access safe, affordable, and appropriate

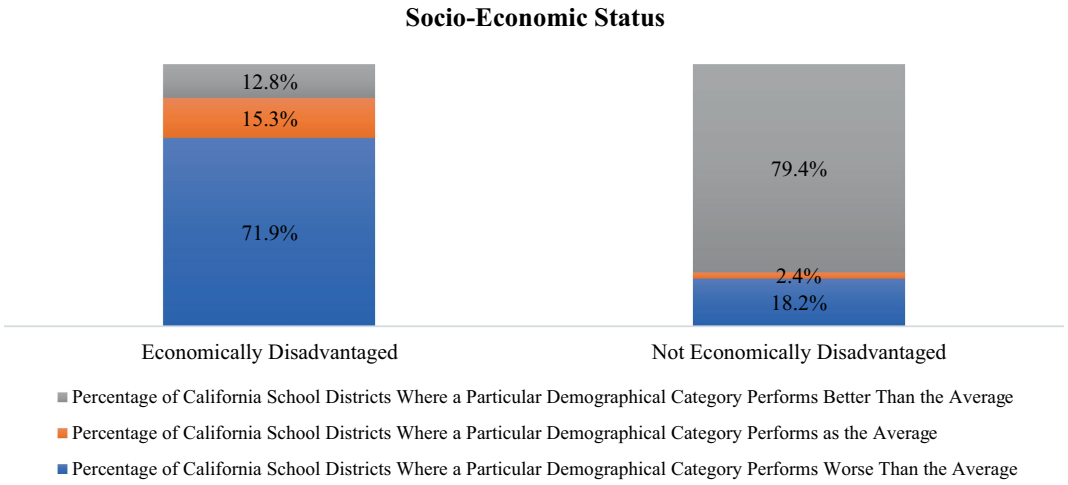

FIGURE 1
Performance of students in physical fitness test by socio-economic status compared to an average student in the district by California school districts, 2019.

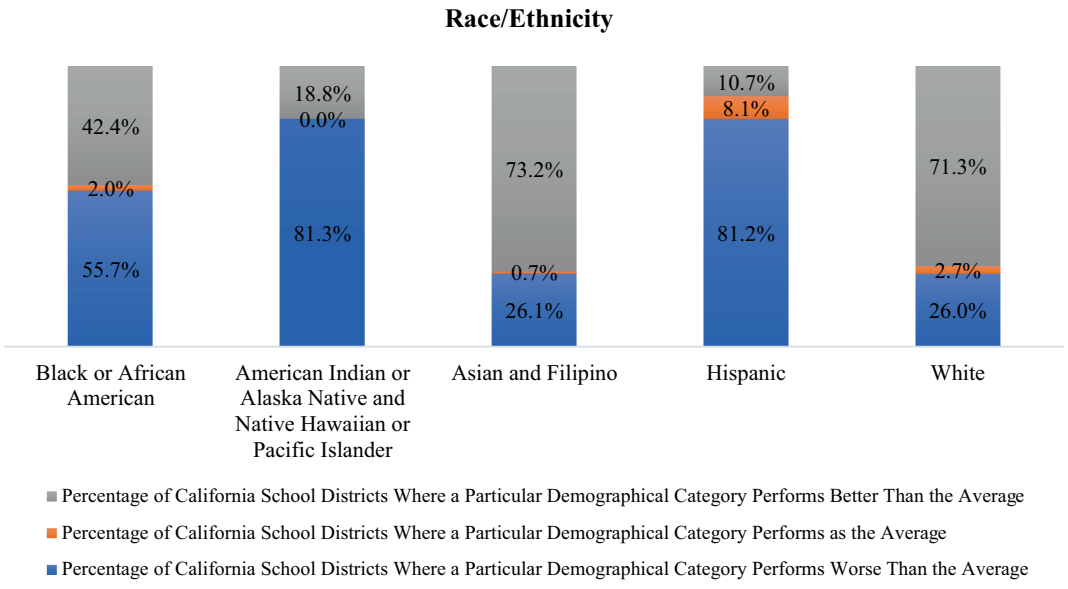

FIGURE 2
Performance of students in physical fitness test by race/ethnicity compared to an average student in the district by California school districts, 2019.

places for physical activity (WHO, 2018), but our findings show that gender plays a less significant role than race and socioeconomic status in determining whether a student is in the Healthy Fitness Zone. At the same time, girls perform better than the average student in most California school districts (61.3%), whereas boys perform worse than the average student in most California school districts (64.0%).

Our findings are of great importance and novelty as they provide profiles of California school districts that tend to have the highest and lowest percentages of students within the Healthy Fitness Zone. A typical school district with the highest percentage of students in the Healthy Fitness Zone has a predominantly White American or Asian American student body, relatively low rates of English language learners and socioeconomically disadvantaged students, and a lack of migrant, foster, and homeless students. A typical school district with the lowest percentage of students in the Healthy Fitness Zone tends to have a predominantly Latin* American student population with a high percentage of socially disadvantaged students, English language learners, and homeless students. For more information regarding the profile of school districts with the highest and lowest percentages of students within the Healthy Fitness Zone refer to Tables 1, 2.

Having reviewed the empirical strategy and the results, we now turn to the discussion.

Discussion

Our study aligns with prior research. For example, we found that socioeconomic status is a key driver of educational inequity in school

TABLE 1 Characteristics of student body in top 10 school districts in the state of California by index of students in Healthy Fitness Zone.

District	Black American	American Indian or Alaska Native	Asian	Filipino	Latin* American	Pacific Islander	White	Two or more races	English learners	Socioeconomically disadvantaged	Migrant	Foster	Homeless
El Segundo Unified	4.3%	0.1%	7.6%	1.7%	23.7%	0.3%	45.7%	16.6%	2.8%	11.1%	0.0%	0.1%	0.2%
Piedmont City Unified	2.0%	0.0%	14.9%	1.1%	10.4%	0.0%	53.0%	18.5%	1.5%	3.2%	0.0%	0.0%	0.3%
Redondo Beach Unified	2.8%	0.1%	11.7%	2.0%	24.9%	0.1%	43.2%	15.2%	4.3%	16.0%	0.0%	0.1%	0.2%
South Pasadena Unified	1.4%	0.0%	32.1%	2.4%	23.1%	0.1%	24.0%	14.0%	4.9%	15.9%	0.0%	0.2%	0.3%
Laguna Beach Unified	0.7%	0.3%	4.6%	1.0%	13.2%	0.0%	69.3%	8.9%	3.0%	20.2%	0.0%	0.1%	0.4%
Los Alamitos Unified	2.4%	0.1%	14.4%	2.8%	29.0%	0.6%	39.5%	10.2%	2.3%	15.7%	0.0%	0.2%	0.4%
Palos Verdes Peninsula Unified	2.1%	0.2%	29.1%	2.0%	14.9%	0.1%	39.9%	10.7%	5.8%	8.7%	0.0%	0.1%	0.2%
Manhattan Beach Unified	1.2%	0.1%	11.4%	1.1%	13.4%	0.2%	58.1%	14.5%	1.6%	4.7%	0.0%	0.1%	0.2%
San Marino Unified	0.5%	0.1%	59.4%	2.0%	6.0%	0.1%	20.0%	11.5%	9.2%	9.8%	0.0%	0.1%	0.0%
Baker Valley Unified	0.0%	0.0%	0.0%	0.0%	87.1%	0.0%	12.9%	0.0%	49.2%	65.3%	0.0%	0.0%	5.6%

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TABLE 2 Characteristics of student body in bottom 10 school districts in the state of California by index of students in Healthy Fitness Zone.

District	Black American	American Indian or Alaska Native	Asian	Filipino	Latin* American	Pacific Islander	White	Two or more races	English learners	Socioeconomically disadvantaged	Migrant	Foster	Homeless
Loleta Union Elementary	0.0%	42.7%	0.0%	0.0%	36.9%	0.0%	10.7%	4.9%	22.3%	93.2%	0.0%	0.0%	13.6%
Alisal Union	0.2%	0.1%	0.3%	0.8%	95.8%	0.1%	1.0%	0.4%	65.5%	92.1%	10.1%	0.1%	15.6%
Northern Humboldt Union High	1.1%	5.4%	1.6%	0.4%	14.2%	0.4%	61.0%	10.6%	2.0%	44.3%	0.0%	1.0%	4.4%
National Elementary	1.4%	0.0%	1.1%	9.2%	83.4%	0.2%	1.5%	1.9%	53.6%	79.0%	0.0%	0.3%	8.6%
South Monterey County Joint Union High	0.1%	0.1%	0.2%	0.4%	95.1%	0.1%	3.7%	0.2%	20.9%	87.4%	5.7%	0.2%	6.7%
Corning Union High	0.8%	1.8%	1.5%	0.4%	65.9%	0.4%	26.4%	1.4%	26.9%	77.2%	1.9%	1.1%	3.1%
Merced Union High	4.0%	0.5%	7.7%	0.7%	71.8%	0.3%	13.0%	1.1%	12.2%	78.1%	1.7%	0.7%	3.6%
Salinas City Elementary	0.6%	0.7%	0.5%	1.0%	91.1%	0.1%	4.2%	1.6%	49.2%	76.1%	4.4%	0.1%	38.0%
Acton-Agua Dulce Unified	7.5%	0.5%	2.7%	0.8%	56.8%	0.2%	24.0%	5.6%	8.1%	66.8%	0.0%	1.1%	3.1%
Anaheim Elementary	1.3%	0.1%	4.6%	1.5%	84.4%	0.4%	4.1%	1.3%	47.1%	76.0%	0.1%	0.8%	8.1%

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physical fitness scores which echoes prior literature findings of self-selected data (Chomitz et al., 2009; Coe et al., 2013; Dusen et al., 2018; McKenzie and Lounsbery, 2009). Additionally, we find that White American students outperform many racial groups including Latin* American, Black American, and Native (American Indian, Alaska Native, Native Hawaiian, and Pacific Islander) students. However, our research also extends prior findings. First, there is little, if any, data on the school physical fitness test scores of migrant youth, foster youth, homeless youth, and Native youth. These populations are typically removed from analysis because of issues with small sample sizes. This study advances our understanding of these populations and the disparities in educational outcomes they experience which is critical to our efforts to eradicate these inequalities. Similarly, we find that Asian American students are outperforming White American students which is an advancement in our understanding of the school physical fitness of both high-performing populations. Lastly, this is one of the first studies to address the educational disparities in school physical fitness for English Language Learners which is a growing population in the U.S. It is crucial to understand the barriers to health facing these growing and marginalized populations. Overall, our findings are a critical first step towards understanding physical fitness test scores in states which mandate it as well as a call to action for states which do not.

Our study also highlights the importance of addressing disparities in physical fitness in order to promote health equity and improve educational outcomes. Identifying demographic and socioeconomic factors associated with physical fitness outcomes among schoolchildren provides valuable insights for policymakers and education stakeholders to create healthier and more equitable learning environments. To ensure that all students have the opportunity to thrive physically, academically, and socially, it is essential to prioritize investments in physical fitness programs and promote inclusive and culturally sensitive approaches.

The implications of this study are crucial for creating healthier and more equitable learning environments in US schools. Investing in physical fitness programs is essential for schools and non-profit organizations that are committed to youth development since there is a positive correlation between physical fitness and academic performance, in addition to preventing obesity and enhancing children's overall health. In light of the results of the study, particular attention must be paid to students of color and marginalized students since these students tend to have lower physical fitness scores. U.S. states and the federal government should mandate, begin, or increase funding for physical education programs in schools. As part of the policy development process, policymakers should ensure that physical fitness programs are protected, and that physical fitness outcomes are showcased on state data dashboards and included in school district and school performance ratings. This will ensure that physical fitness is just as important as academic performance indicators. It is important to use the data presented in the study and data more generally in order to develop public health initiatives that aim to promote physical fitness among children and adolescents. As part of those initiatives, additional public parks, recreational facilities, sidewalks, and biking paths could be constructed to promote an active lifestyle outside of the classroom. Investing in the physical health of schoolchildren now will result in positive economic and social changes in the future, including a reduction in healthcare costs and an increase in the productivity of the future workforce.

At the policy level, physical fitness has important implications for the state, the nation, and the globe. The annual cost of health care in America is $117 billion as a result of insufficient physical activity, for example (Prevention, 2023). Moreover, only 39% of the U.S. population lives within half a mile of a park such that school becomes an increasingly important place for children to access physical education (Prevention, 2023). Increasing retail economic activity and employment, increasing property values, revitalizing neighborhoods, and reducing health care costs for future youth with positive physical fitness outcomes are all ways that the federal government and states can build economics in schools (Prevention, 2023). Moreover, countries incur additional returns on investments in physical activity including a reduced use of fossil fuels, cleaner air, and less congested, safer roads (WHO, 2018). More programs, available data, and subsequent research, such as research conducted by Podnar et al., 2021; Álvarez-Fariña et al., 2020; Neshteruk et al., 2023, could influence the way the country thinks about implementing and financing physical fitness in schools—which could reduce obesity trends in America. Specifically, more research might convince the federal and state government(s) to spend more on physical education programs, data capacity, and, as a result, save more on annual health costs and reduce educational inequity.

Physical fitness has important implications for individuals and society as a whole (Moliner-Urdiales et al., 2010; Silventoinen et al., 2021). Overall, at the individual level, physical fitness can positively impact health (Ogden et al., 2020). In schools, an increase in moderate-to-vigorous levels throughout a physical education course can provide significant benefits to public health, especially among high-risk youth (Poitras et al., 2016). Moreover, physical fitness is positively associated with academic performance. Specifically, physical fitness and math, reading, and social studies tests are positively associated among elementary and middle school students in America (Bass et al., 2013; Coe et al., 2013). Despite this critical research on the individual benefits of physical education courses, there is a general lack of literature on the impact of school funding and physical fitness which is crucial to ensuring students even have access to physical education programs which, in turn, necessitates more data and research to fill that important gap.

Conclusion

What if programs and subsequent data and research on physical fitness in schools could reverse the decline of physical fitness activity among American schoolchildren and ameliorate skyrocketing obesity trends among school aged youth? Despite global, national, state, and local concerns about obesity as well as an overall decrease in physical activity among youth these last 30 years, physical fitness programs continue to be eliminated in American schools (Azzarito and Solomon, 2005; Masanovic et al., 2020). Despite this, more than one-fifth of US adolescents between the ages of 12 and 19 are obese (Ogden et al., 2020). Physical education programs are vital to obesity prevention programs for youth because adolescent obesity predicts adult obesity. The health of American schoolchildren is at risk if physical fitness programs fail to be mandated and continue to be eliminated.

We have developed future research directions and policy interventions aimed at addressing obesity and decreasing physical activity levels among American school children, as well as improving the equity and justice of physical education in American schools. The recommendations we provide are based on the current conditions in various states of the United States and on the experiences of other countries. See Table 3 for information on how those future research

TABLE 3 Exercising educational equity key findings, examples, citations, results of the study, future research directions, and policy interventions.

#: Key findings	Examples and citations in the literature	Results of the study	Future research directions and policy interventions
1: Schools students' health has declined while obesity has increased	- Due to the lack of safe, affordable, and healthy physical activity options for children, and the decrease in physical activity rates, programs, data, and research on physical fitness are important in schools, where children spend a significant amount of time (Yuksel et al., 2020). - The remote learning experience resulted in many students' body mass indexes increasing while their muscular strength decreased due to less physical activity and a less active lifestyle (Nolan and Zbaracki, 2023).	- There are a limited number of states in America that mandate physical education for kindergarten through 12th grade students despite childhood obesity trends. - There are few studies investigating the outcomes of physical fitness tests among schoolchildren in the U.S. despite the size and severity of the problem.	- Federal legislation is needed to require all states to mandate physical education for students from kindergarten through 12th grade. The absolute majority of countries in the world have made physical education in schools mandatory (United Nations, 2015). - There is a need for increased funding of physical education programs, especially in underfunded school districts. This policy intervention is also supported by the American Public Health Association (2021), which states that increased physical activity among school-aged children is an important investment in the health and well-being of young people in the United States. - In order to prevent childhood obesity, there is a need for public awareness campaigns that educate parents, students, and communities about the importance of physical activity. Among such campaigns is the one launched by Arizona Department of Health Services (2016) called "Put a Little Play Into Your Day" in order to increase physical activity in the state. - It is imperative that more educational research be conducted on the topic of physical fitness in schools.
2: Minoritized groups in physical education in schools	- Children from low-income families and especially those who are racially minoritized are more likely to engage in unhealthy behavior (Chomitz et al., 2009; Coe et al., 2013; Dusen et al., 2018).	- Students from economically disadvantaged backgrounds consistently showed lower levels of physical fitness. - Latin* American and American Indian or Alaska Native and Native Hawaiian students perform worse than the average California student.	- Funding should be increased for schools that serve economically disadvantaged students, particularly those with large Latin* American and American Indian or Alaska Native and Native Hawaiian populations. A good example would be the California Local Control Funding Formula, where the resources are provided based on student needs rather than local wealth (Learning Policy Institute, 2023). - There is a need for a policy that ensures that after-school sports and physical activity programs are available to economically disadvantaged and minority students. Some states were recently working on legislation to support this initiative, such as Oklahoma with HB 45 and Connecticut with HB 7,427 (National Conference of State Legislatures, 2023). - More studies are needed to examine physical fitness outcomes in other states based on socio-economic status, race, and ethnicity.
3: Socio-economic status is the key driver of disparities in physical education in schools	- Educational inequity in school physical fitness is driven by socioeconomic status (Chomitz et al., 2009; Coe et al., 2013; Dusen et al., 2018; McKenzie and Lounsbery, 2009).	- Schools with the highest percentage of Healthy Fitness Zone students tend to have predominantly White American or Asian American students, relatively low numbers of English-language learners and economically disadvantaged students, and no migrants, foster children, or homeless students. - Most school districts with the lowest percentage of Healthy Fitness Zone students have a predominantly Latin* American student population with a high percentage of socially disadvantaged students, English language learners, and homeless students.	- Data on physical fitness outcomes by race, ethnicity, socioeconomic status, and language proficiency should be collected and publicly reported. This data can help identify disparities and guide policy interventions. According to the study conducted by Krochmal et al. (2021) only ten states in the US provide publicly available data regarding physical education in schools. Among those states are California, Connecticut, Delaware, Georgia, Illinois, Missouri, South Carolina, Texas, Virginia, and West Virginia. Additionally, only a few of those states have data about physical fitness by race, ethnicity, socioeconomic status, and language proficiency. - More research is needed on migrant, foster, homeless, and Native youth physical fitness test scores. - More research is needed on the school physical fitness disparity among English Language Learners, an increasing population in the US.

directions and policy interventions relate to discussions in the literature and findings of our study.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

Author contributions

D'ST: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing. RK: Data curation, Formal analysis, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1433466/full#supplementary-material

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