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To cite this article: Nicole Fiscella, Jaehun Jung, MooSong Kim & Willie Leung (2024) The Odds of Meeting Physical Activity Guidelines in Children Receiving School-Based Fitness Testing Awards: NHANES 2013–2016, Journal of Physical Education, Recreation & Dance, 95:4, 7-12, DOI: [10.1080/07303084.2024.2308243](https://doi.org/10.1080/07303084.2024.2308243)

To link to this article: <https://doi.org/10.1080/07303084.2024.2308243>



Published online: 25 Apr 2024.



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The Odds of Meeting Physical Activity Guidelines in Children Receiving School-Based Fitness Testing Awards:

NHANES 2013-2016

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With many schools having resumed in-person learning after the COVID-19 pandemic, it is important to reassess where physical education (PE) teachers stand when it comes to PE standards and practices of in-person learning and, more specifically, when it comes to promoting engagement in physical activity (PA) in and outside of the classroom. Reductions in PA levels were noted globally among children and adolescents, especially with the temporary closing of schools and shift to virtual learning (Neville et al., 2022). Now that in-person learning has resumed and with a new academic year around the corner, this is an ideal time for PE teachers to consider the ways in which they can support their students' engagement in PA both inside and outside of the school setting. Prior to the pandemic, policies were put in place to provide an objective goal for PE teachers and students to work toward. One such example is the American PA guidelines, which state that children should participate in at least 60 minutes of moderate-to-vigorous PA per day (U.S. Department of Health and Human Services, 2018). Across parts of the United States, many schools follow the PA guidance set forth by the Centers for Disease Control and Prevention and recommend 120 minutes per week be allotted toward PE class. For example, in the state of Oregon, schools are required to meet a minimum of 150 minutes of PE per week during the entire school year (Oregon Department of Education, 2017). Furthermore, some states have more specific policies geared toward increasing PA levels during PE class (Carlson et al., 2013). How teachers choose to utilize this time, however, is up to them. It is not uncommon for PE teachers to incorporate fitness awards and testing during multiple classes over the course of the year.

Fitness Testing

The idea of fitness testing began around the 19th century, with organized fitness testing starting around the middle of the 20th century (Pate et al., 2012). Fitness tests were originally used as a way to assess anthropometric measures of students; the idea of "physical efficiency" was incorporated years later. More recently, awards have been used in many schools across the country to promote health and fitness among students. Fitness tests occur during PE class, with one notable program being the Presidential Youth Fitness Program, formerly known as the Presidential Fitness Test. At its core, this program is designed to promote health and PA for youths (U.S. Department of Health and Human Services, 2021). Since its inception in the 1950s, it has gone through few revisions until recently, when several core updates were made. As it stands, emphasis is placed on learning how to live a physically active and healthy lifestyle in school and out. According to SHAPE America – Society of Health and Physical Educators (2017), one of the goals of fitness testing is to promote PA

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levels for children. There are six categories within FitnessGram: (a) aerobic capacity, (b) body composition, (c) abdominal strength and endurance, (d) trunk extensor strength and flexibility, (e) upper body strength and flexibility, and (f) flexibility. Within these components are a total of 13 fitness tests that each have their own criteria used to assess students' health. Through the Presidential Youth Fitness Program, students who participate in physical activity on a daily basis and score in the Health Fitness Zone in at least five of the six FitnessGram categories are eligible to receive a fitness award (Presidential Youth Fitness Program, 2017).

Student Awards in School

The premise behind academic awards is to reward students who have applied themselves in school and achieved success. One of the first academic awards was presented as an experiment in 1955–1956 with the hope of fostering citizenship, leadership, and scholarship (Caplan, 1956). Since then, academic awards have been, and still are, used as a way to increase students' performance in academia, now expanding into various facets within schools (e.g., leadership and health/physical activity). The President's Education Awards Program is a prime example of a long-standing academic award that aims to highlight various student achievements from kindergarten through 12th grade (U.S. Department of Health and Human Services, 2021). Since 1955, research has been conducted to examine the impact such awards have had on changing students' behaviors via increased motivation and goal setting (Kelley et al., 2000; Ruiz, 1982). Kamenos (2015) found that programs such as the Student Recognition and Goals Program, which awards student achievements and positively reinforces work habits and behavior in the classroom, resulted in 74% of students ($n=137$) improving their work performance following the first award ceremony. This program helped students set mastery goals, bettering themselves internally and motivating themselves to rise to the challenge. Awards can be used to highlight the success of students in minority groups who are also excelling in their studies (Mamlok-Naaman, 2021). It is possible, however, that such awards may serve as extrinsic motivators for students who are seeking external validation (Ozturk & Debelak, 2008). More recent studies have sought to examine the impact of awards on student emotions and motivation as well as teacher motivation for use of these awards (Haywood et al., 2008). Motivation is a key factor when it comes to student learning. Providing a motivator for students can lead to the development of study habits or goals (Wardani et al., 2020). It is possible that similarities can be drawn between academic awards and fitness awards.

It is assumed that students who earned awards or achieved the healthy fitness zone in fitness tests are more likely to engage in PA compared to their counterparts (Tucker et al., 2014). Previous studies have suggested that earning school-based fitness testing awards (fitness awards) would enhance children's motivation to engage in PA, resulting in an increase in their PA levels (Corbin et al., 1990; Domangue & Solmon, 2010; Prong et al., 1992; Whitehead et al., 1990). However, there is limited information regarding the relationship between earning fitness awards and meeting PA guidelines, although a few studies examined the relationship between receiving fitness awards and the status of PA motivation (Corbin et al., 1990; Domangue & Solmon, 2010). The test that targets aerobic capacity, body composition, muscular strength and endurance, and flexibility should be discussed in advance by the PE teacher to help ensure that students understand the purpose of the test.

Utilization of Fitness Awards

For the current study, the authors used data from the 2013 to 2016 National Health and Nutrition Examination Surveys (NHANES) to examine the relationship between meeting PA guidelines and receiving a fitness award. NHANES is an ongoing survey to assess the health and nutritional status of adults and children in the United States. The data collected consist of a nationally representative sample of individuals living in the United States. A parent or guardian provided information for survey participants who are under 16 years of age. Only participants ages 5 to 15 years old ($N=3,973$) were included in the analysis. **Table 1** reports the unweighted sample size and weighted means/proportions with 95% confidence intervals for the analytic sample characteristics.

Receiving a fitness award was classified using the following question item with a yes or no question: “In the past year, did {you/sampled persons} receive a Physical Fitness Test award, such as a President’s Challenge or FitnessGram award?” In addition, the meeting physical activity guidelines variable was classified using the following question item: “During the past 7 days, on how many days were {you/the child}

physically active for a total of at least 60 minutes per day? Add up all the time {you/he/she} spent in any kind of PA that increased {your/his/her} heart rate and made {you/his/her} breathe hard some of the time” (i.e., response options: 1 day to 7 days). Children with a response of “seven days” were identified as meeting PA guidelines in accordance with the *National PA Guidelines for Americans*, 2nd Ed. (2018 Physical Activity Guidelines Advisory Committee, 2018).

Among children receiving awards, 42.2% (95% confidence interval [CI] [37.76, 47.64]) met the current PA guidelines compared to 57.80% (95% CI [52.36, 63.24]) who did not. Among the children who did not receive awards, 43.11% (95% CI [41.09, 45.13]) met the PA guidelines and 58.89% (95% CI [54.87, 58.91]) did not. Using logistic regression, the authors found that meeting the PA guidelines was not impacted by receiving a fitness award; that is, receiving fitness awards might have a limited impact on promoting children’s PA levels. Additionally, children who received fitness testing awards did not have significantly higher odds of meeting PA guidelines compared with peers who did not earn fitness awards under the unadjusted and adjusted logistic regression models (odds

Table 1.
Characteristics of School-Age Children (5–15 Years) Participating in the 2013–2016 NHANES Based on School-Based Fitness Testing Awards Question ($n=3,973$)^a

Variable	Unweighted n	Weighted Mean/Proportion (%)
Received school-based fitness testing award		
Yes	352	9.86 (8.44–11.28)
No	3,621	90.14 (88.72–91.57)
Met physical activity guidelines		
Yes	1,876	43.02 (41.28–44.76)
No	2,097	56.98 (55.24–58.72)
Age (years)	3,973	10.49 (10.38–10.60)
Gender		
Male	2,037	51.81 (49.41–54.21)
Female	1,936	48.19 (45.79–50.59)
Body mass index (kg/m^2)	3,840	20.29 (19.98–20.61)
Race		
Mexican American	880	15.59 (10.75–20.42)
Other Hispanic	469	8.31 (6.34–10.27)
Non-Hispanic White	1,052	52.04 (43.87–60.22)
Non-Hispanic Black	965	13.91 (9.89–17.93)
Non-Hispanic Asian	340	4.70 (3.21–6.19)
Other race, including multiracial	267	5.45 (4.22–6.68)
Poverty income ratio	3,660	2.48 (2.26–2.69)
Diagnosis of asthma		
Yes	751	18.36 (16.50–20.23)
No	3,220	81.64 (79.77–83.50)
Participated in school sports		
Yes	1,539	40.07 (36.82–43.33)
No	2,432	59.93 (56.67–63.18)
Engaged in physical activity past seven days		
Yes	3,198	81.47 (79.71–83.24)
No	773	18.53 (16.76–20.29)
Participated in moderate-to-vigorous PA for at least 60 minutes per day	3,973	5.01 (4.91–5.10)

^a*Italics indicate mean value and 95% confidence interval for continuous variables.*



ratio = 0.96, 95% CI [0.73, 1.27]; adjusted odds ratio = 0.94, 95% CI [0.72, 1.23]). Similar results were found among students with disabilities (Leung & Fiscella, 2021). These results highlight that the use of fitness awards and testing may not have the impact that was initially intended. To flip this narrative, the PE teacher must first consider what their intention is with fitness awards and testing.

PE Teachers and Fitness Testing and Awards

Selection of Fitness Testing and Awards

When it comes to selecting fitness tests and awards, it is important for the PE teacher to consider what their goal is. School-based fitness tests include award programs (i.e., performance versus process-based awards) to motivate children's fitness behaviors. Performance-based fitness awards such as FitnessGram (i.e., meeting a criterion such as healthy zone) and President's Challenge (i.e., meeting a norm such as above the 80th percentile) would not be directly relevant to children's PA behavior (Pangrazi & Beighle, 2012; Pate et al., 1990). Rather, they would be associated with children's fitness capacity or ability. Performance-based fitness awards would discourage the least-skilled or least-fit children from adopting positive PA behaviors (Domangue & Solmon, 2010). To make up for this gap, process-based awards (i.e., achieving fitness behavior goals or fitness improvement) such as the FitnessGram Honor Award and Physical Activity Lifestyle Award could be given to encourage increased participation in PA,

especially because these process-based awards provide more opportunities for children to experience mastery attempts related to PA (e.g., meeting the PA guidelines) regardless of fitness capacity and physical conditions/disabilities (Corbin et al., 1988; Plowman et al., 2006).

Scholars have previously encouraged school administrators and PE teachers to use both performance- and process-based fitness awards together to motivate and promote students' PA behavior (Kulinna & Krause, 2001; Plowman et al., 2006). Specifically, school administrators or PE teachers could create more informative and enjoyable fitness education environments focused on individual fitness behavior, monitoring fitness behavior progress by adopting process-based fitness awards during PE. This allows children to feel more competent and motivated, which in turn promotes PA levels.

Attitudes and Emotions of Students

A recent study by Simonton et al. (2019) examined how the use of fitness tests impacts students' experiences with PE. After completion of the FitnessGram, they found that tests such as the PACER elicited lower levels of negative emotion toward PE in both males and females, whereas performance on the curl-up test led to higher levels of negative emotion toward PE. Though the authors noted that, overall, the test had limited association with students' future attitudes and emotions with regard to PE, they highlighted the need for consideration prior to selecting a fitness test. In addition to



considering whether to choose a process-based or performance-based test, the PE teacher should consider how the test may impact the students' attitudes toward and perceptions of PE. Negative emotions regarding fitness or engagement in PA during PE could lead to overall decreases in PA (Cardinal et al., 2013).

The topic of fitness testing and the impact it can have on students emotionally has received a great deal of attention. One way PE teachers may consider reducing possible negative attitudes is by taking the time to teach students about why the fitness testing is occurring; the connection it has to their health, both current and future; and why it is important to complete fitness testing. Additionally, reviewing the fitness test results with the students and explaining what they mean can allow them to better understand where they stand with their health. A student's emotions and attitudes can shape how they take in information, make decisions, and engage in activity. Considering how this can factor into fitness testing can make it a more positive experience for both the students and teacher.

Limitations

This study is not without its limitations. Of note, the sample size is not balanced between the groups of school-age children receiving school-based fitness testing awards and not receiving awards. Three hundred fifty-two students received fitness awards, compared to 3,621 who did not. Due to the unbalanced sample

size between the two groups, caution should be taken when interpreting the results. However, the current analysis utilized sample weights based on census, which allowed for better representations of the population using the current sample. Using survey analysis and sample weights based on census considers the demographic characteristics of the participants and allows for more precise estimations.

Conclusion

In summary, school administrators and PE teachers need to consider offering process-based fitness awards along with performance-based fitness awards to promote children's PA levels. The results of the current analysis found that receiving fitness awards in PE might not necessarily increase the likelihood of meeting the current PA guidelines. On the other hand, school-based fitness award programs can support informative and progressive fitness education during PE that increases students' enjoyment of PA and fitness behaviors. PE teachers must consider what the goal of the fitness testing is and educate students on why it is being done, which can lead to more positive attitudes toward both fitness testing and PE class.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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