

Adolescent Girls' Preferences Pertaining to Cardiovascular Fitness Testing: A Comparison between the One-Mile Run and PACER Tests

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Abstract

Many adolescent girls are not participating in the recommended levels of physical activity (PA) and are at risk for unhealthy lifestyles (U.S. Department of Health and Human Services, 2008). Helping girls understand the importance of PA and giving them positive experiences in physical education classes, including fitness testing, may help to increase girls' PA. The purpose of this study was to determine: if girls understand the purpose of cardiovascular (CV) fitness testing, which CV test they prefer, which CV test they try harder on, and their likes and dislikes concerning CV fitness testing. Results showed girls preferred the PACER test ($\chi^2=11.31, p=.001$). Themes that became apparent from qualitative analysis indicate several reasons for test preference. Results also indicate there are a number of girls who prefer each CV test for a variety of reasons. Researchers recommend that girls be allowed to choose which CV test to participate in.

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Obesity has become an epidemic in America and contributes to a number of health concerns among which are diabetes, cardiovascular (CV) disease, and cancer (Kim & Popkin, 2006). Research has shown that as children enter adolescence, there is an increase in body weight (Kimm, et al., 2005) and a decline in physical activity (PA) (Kimm, et al., 2002). The U.S. Department of Health and Human Services (2008) reported that only 35% of adolescents in grades 9 through 12 engaged in the physical activity (PA) that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes per day (currently recommended levels of PA). Of these students, only 27% of the girls and 43% of the boys participated at these recommended levels. So girls have real inactivity issues, also corroborated by Kimm et al. (2002).

This decrease in girls' PA could be linked to the fact that during adolescent years, a high percentage of girls don't like physical education classes due to lack of interest in the curriculum, dislike of teachers (Luke & Sinclair, 1991), and threatening boys' behavior that creates a perceived unsafe environment (Constantinou, Manson, & Silverman, 2009). Studies suggest that physical educators create a less positive environment for girls than they do for boys. Dunbar & O'Sullivan (1986) found girls received less feedback than boys, and Macdonald (1990) found boys had a greater proportion of verbal interactions and also had more positive interactions with the teacher than girls. These three factors: girls being less active than boys, a tendency to dislike physical education, and a less positive environment by teachers toward them put adolescent girls at risk for unhealthy lifestyles.

Professionals are attempting to encourage youth to maintain sound health at a young age (Ferguson, Keating, Bridges, Guan, & Chen, 2007); and help develop "individuals who have the knowledge, skills, and confidence to enjoy a lifetime of healthful physical activity" (National Association for Sport and Physical Education, 2004, p. 11). Therefore, it is vital to promote positive experiences and eliminate negative experiences for girls in physical education classes. This includes fitness testing.

Thousands of American youth have taken fitness tests since they were implemented in the 1960s; and fitness tests are still one assessment used in physical education today (Hopple & Graham, 1995). One of the most common memories adults have of physical education is that of fitness testing (Hopple & Graham, 1995).

Unfortunately these memories can be negative (Pangrazi & Corbin, 1993).

One of the purposes of fitness testing is to provide feedback to students and parents and encourage students to adopt PA patterns that will lead to improved health and fitness (Ernst, Corbin, Beighle & Pangrazi, 2006). Students who have a negative attitude toward fitness testing may be less likely to assess their progress as adults (Stewart, Boyce, Elliot, & Block, 2005). There is some evidence that suggests performance on childhood fitness tests could predict adult PA levels (Dennison, Strauss, Mellits, & Charney, 1988).

Fitness tests have changed since they were implemented in the early 1960s. As the physical activity level of American youth has decreased and obesity levels have increased, researchers have been supportive of the development and use of health-related fitness tests (Fox & Biddle, 1988). These tests focus on key health-related fitness components: body composition, CV fitness, muscular strength, muscular endurance, and flexibility. They also promote the importance of lifetime fitness for a healthy life.

One such health-related fitness test that is widely used is the FITNESSGRAM (The Cooper Institute, 2010), which was created in 1982. The FITNESSGRAM (Meredith & Welk, 2005) is a criterion-referenced test that evaluates health-related fitness components. It measures CV fitness by using either the one-mile run or the Progressive Aerobic Cardiovascular Endurance Run (PACER) test. These two tests have been established as the most valid and reliable methods to use when assessing the CV fitness of school-age youth in a field setting (Beets & Pitetti, 2006).

In 1995, Hopple & Graham researched student perceptions of the one-mile run and discovered that 4th and 5th grade students showed little or no understanding of why they had to run the mile; these students also reported having little or no fun while taking the test. While administering the mile run is easy for physical educators, student effort has been a major concern, especially for girls (Vincent, Barker, Clarke, & Harrison, 1999). Hill (2000) suggested a number of factors that may discourage children from enjoying running: perceptions of being inadequate, physical discomfort, and a lack of understanding of the benefits of running. Weather conditions and lack of training may also contribute to negative attitudes toward the mile run (Meredith & Welk, 2005). Meredith and Welk suggest the mile run is good for students who enjoy running and are highly motivated, but for those not as motivated, such as some students in

physical education classes, the FITNESSGRAM lists the PACER as an alternative to the mile run test, because many students in physical education may not be excited to run around the track.

Put simply, the PACER is a 20-meter shuttle run developed in 1982 by Leger and Lambert (Meredith & Welk, 2005). The PACER is a multi-stage CV fitness test that is progressive in nature with the difficulty increasing in one-minute increments. The progressive nature of the test provides a built-in warm-up and teaches children to pace themselves (Meredith & Welk, 2005). The test can also be set to music in order to create a fun alternative to other test methods used to test CV fitness (e.g., the mile run).

Physical educators have a responsibility of providing motivating learning environments, including when testing CV fitness. Such environments are important to promote and help girls to become motivated to try their best. Given the lack of participation in PA by girls, the development of an environment in which to promote PA and CV fitness is important to consider from early on, before they reach high school. Additionally, girls need to understand the importance of CV fitness testing as well as the benefits of participating in such testing if there are to be lasting benefits. Currently, no published studies have attempted to determine which CV fitness test girls prefer.

The purpose of this study was to determine which CV fitness test junior high school girls prefer: the one-mile run or PACER test. This study was designed to answer the following research questions: (a) Do junior high school girls understand the purpose of running the one-mile run and PACER tests? (b) Which CV fitness test do junior high school girls prefer? (c) Which test do they try harder on? (d) What do they like and dislike about the one-mile run and PACER test?

The FITNESSGRAM test offers the option of participating in the one-mile run or PACER test, and so it is important for physical educators to understand girls' perceptions of these tests. This information is important so physical educators can (a) increase effort among girls while participating in CV fitness testing, and (b) decrease the likelihood of developing negative attitudes toward fitness testing and PA, and promote positive attitudes instead.

Method

Participants and Setting

Junior high school girls ($N = 154$) from one suburban school in the western United States participated in this study in September and October. Participants were from the 7th ($n = 45$), 8th ($n = 42$), and 9th ($n = 67$) grades. The sample population was White (75.2%), Hispanic (17.3%), Asian (2.4%), African American (1.9%), Pacific Islander (1.9%), Native American (.9%), no ethnicity declared (.4%). Parental and child permissions were obtained prior to the study. Permission to conduct this study was also obtained from the school, school district, and the University Institutional Review Board for the Protection of Human Subjects.

One full-time physical education teacher taught the girls in this study and was also the researcher. Physical education is required to be taken for one semester in seventh, eighth, and ninth grade. Girls may choose to take physical education for two semesters a year, but the second semester is considered an elective course.

The physical education classes were single gender classes. Seventh and eighth grade classes were combined, and girls participated in a team sports curriculum, while the ninth grade curriculum focused on and promoted individual and lifetime sports. The average class size was 43 girls. The teacher had taught at the school for three years and conducted both the one-mile run and PACER test all three years, but only the PACER had been used in CV fitness testing. Every girl in physical education classes was required to participate in both tests. Girls were not graded based on their performance scores but received points for participating in the test.

Procedures

On the first day of the fall semester, the girls listened to a lecture on fitness testing given by the physical education teacher. Information that was given included a brief description of CV fitness, informing girls that the two tests measured CV fitness and they would have the chance to practice both tests, an explanation of the importance of fitness testing scores to determine whether girls are in the healthy fitness zone (HFZ), what the results mean regarding reducing risk for disease, and encouraging girls to pace themselves on the tests. A university faculty member was present to ensure the teacher

adequately taught the purpose of CV fitness testing to the girls. The girls ran the mile run and the PACER test once during the first week of school and once during the second week to practice the tests. No scores were recorded. The regular curriculum resumed during the third and fourth week of school and girls were given a rest from participating in CV fitness tests.

A crossover design was used in this study. Test administration order was randomly assigned to the six female classes. During the fifth week of school three of the classes (two seventh/eighth grade classes and one ninth grade class) started by participating in the PACER test and three classes (two seventh/eighth grade classes and one ninth grade class) started by participating in the one-mile run. A period of one week was allotted for rest (week six). At the beginning of the seventh week, those who started with the PACER now ran the mile and those who started with the mile run performed the PACER. The physical education teacher administered these CV fitness tests. The day after the second test was administered, girls filled out a written questionnaire relating to their perceptions of both fitness tests. The questionnaire took about 15 minutes for girls to complete. Girls were reminded that their responses had no effect on their grade in their physical education class. Girls who returned a signed consent form and participated in the study were given 15 extra-credit points. Those girls who chose not to participate in the study were offered an alternative extra-credit assignment for the same number of points.

Data Sources

Researchers used three different methods to collect data: questionnaires, follow-up interviews, and researcher's field notes.

Questionnaires. The questionnaire consisted of six open-ended questions and one test preference question (found in the Results section). A group of university physical education faculty reviewed the questionnaire to ensure content validity. Through the open-ended questions the questionnaire was designed to discover girls' perceptions of the PACER and one-mile walk/run.

Follow-up interviews. University faculty members reviewed the interview questions to confirm content validity. The questions were designed to follow up on responses given on the questionnaire and to confirm girls' perceptions. For example, if a girl preferred the PACER and had responded on the questionnaire that it was

because they ran in a group, then a follow-up question was, “What was it about running in a group that was helpful to you?” Based on the questionnaire responses, six girls were purposely chosen for a follow-up interview. These six girls were selected based on their responses and preferences. Girls from all grades were equally represented in the interviewing process. Two girls were selected from each grade to be interviewed; one that preferred the one-mile run and one that preferred the PACER test. Follow-up interview questions were asked and used as a source of data (Patton, 1990). These interviews allowed the researchers to get more in-depth responses as well as to understand the thought processes of the students (Hopple & Graham, 1995).

Individual interviews took place two weeks after the completion of both CV fitness tests and the questionnaire. The interviews were conducted and recorded by a university faculty member in the physical education teacher’s office during the girls’ regular physical education class time. The girls had not had previous contact with the interviewer.

Before beginning the interview girls were assured their responses were confidential and they could decline to answer any of the questions. The girls were also informed they may exit the interview whenever they chose. The interviews focused on girls’ overall perceptions of CV testing, why they believed they were required to participate in such testing, and reasons for their CV fitness test preference. The interviews each lasted about 15 minutes and girls were asked not to talk about their responses with others.

Field notes. The researcher took field notes throughout the study and the university faculty member took field notes during the interviews. These notes consisted of insights, emerging ideas, hunches, and summaries of conversations obtained throughout the data analysis process (Bogdan & Biklen, 1998). The teacher’s current unit plan, which covered the fitness concepts taught, was included in the researcher’s field notes.

Data Analysis

The survey responses, interview transcripts, and field notes were included in the data analysis. The researchers used the constant comparative method to identify common themes among the responses the students provided (Lincoln & Guba, 1985). All of the student responses were coded based on common themes and the

outcome included those themes most highly represented (Hopple & Graham, 1995).

A chi-square test was used to determine if the difference between test preferences was significant. The chi-square test was also used to compare the data by grade level.

Establishing Trustworthiness

A researcher may assume diverse membership roles while involved in qualitative research. There are three principal roles that may be assumed: (a) the complete member, (b) the active member researcher, and (c) the peripheral member researcher (Adler & Adler, 1994).

The girls' physical education teacher was the primary researcher in this study (the complete member) and administered the CV fitness tests as well as the questionnaires to her classes. A university professor interviewed the girls and assumed the active member researcher role. The primary researcher coded all of the responses.

Peer debriefer. The primary researcher worked with the university professor on a regular basis to review and analyze data as well as to avoid any researcher bias. The researcher also met with the university professor to discuss themes emerging from the collected data. All questions raised by this expert were answered and appropriate revisions were made (Hopple & Graham, 1995).

Results

Responses to the seven questions on the questionnaire and the interview transcripts were combined and allowed researchers to develop a number of themes for each question. Each question and its accompanying themes are addressed.

What is the Purpose of Running the One-Mile Run and the PACER?

From girls' responses to this question three themes became apparent: 1) test CV fitness, 2) improve time/score, and 3) learn to pace.

Test CV fitness. Girls' responses (75%) demonstrated that they understood the purpose of running the one-mile run and PACER by responding with an answer that fell under this theme. In an interview, a ninth grade girl described the purpose of these two tests by responding, "I just know you have got to see how good your CV

fitness is.” When asked what CV fitness was her response was, “I think it’s the ability of your heart to pump the blood.” The same girl also demonstrated that she knew the blood was carrying oxygen.

Improve time/score. Fourteen percent of the girls felt these tests were run so that they could improve their time or score on the tests. One ninth grader responded, “We run the tests to improve our times and endurance so we can be healthier.”

Learn to pace yourself. Eleven percent of student responses fell under this theme. A seventh grader stated, “These tests help us learn how to pace ourselves and not go our fastest in the beginning or we will not do as well.”

Which Cardiovascular Fitness Test Do You Prefer to Participate In?

Sixty-two percent of the girls in the study reported that they preferred to participate in the PACER; while 38% reported that they preferred to run the one-mile run; (see Table 1). A chi square test was used to determine if the difference between preferences was significant. The females significantly preferred the PACER test to the one-mile run ($\chi^2=11.31, p=.001$). The chi-square test was also used to compare the data by grade level. The only grade level that was significantly different in student preference was the ninth grade. Girls in ninth grade significantly preferred the PACER ($\chi^2=7.12, p=.008$).

Table 1

Cardiovascular Test Preferences

Test	Grade			Combined	%
	7	8	9		
PACER	27	27	42	96	62
One-mile run	18	15	25	58	38
Total	45	42	67	154	100

Note. A chi-square test results indicated that the girls’ preference for the PACER test was significant ($\chi^2 =11.31, p=.001$). Regarding grade level, girls in ninth grade significantly preferred the PACER ($\chi^2=7.12, p=.008$).

Which Test Did You Try Harder On and Why?

Fifty-four percent of the girls who participated in the survey reported that they tried harder on the one-mile run, while 36% reported that they tried harder on the PACER. Six percent of the girls reported that they tried equally hard on both tests (Four percent didn't answer the question).

Reasons girls gave for trying harder on the one-mile run were: 1) it was harder to score in the HFZ, 2) they wanted to beat their previous time, 3) they were required to complete the required distance, and 4) they could set their own pace.

Harder to score in the HFZ. Of the girls who tried harder on the one-mile run, 43% reported that they did so because it was harder for them to score in the HFZ. A ninth grade girl responded, "I tried harder on the mile because I know I can score in the healthy fitness zone on the PACER, but on the mile it is harder for me."

Try to beat previous time. Of the girls who felt they tried harder on the one-mile run, 33% reported that they did so because they wanted to beat their goal or improve their time. A seventh grade girl reported, "I tried harder on the mile, because I am always trying to beat my fastest time and see how much I have improved."

Have to finish the required distance. Seventeen percent of the girls who tried harder on the one-mile run reported that it was because they were required to complete all four laps. One ninth grader who was interviewed said, "The mile is harder because you have to run a certain amount, all four laps. With the PACER you can just quit."

You can set your own pace. Of the girls who reported trying harder on the one-mile run, 7% of the responses were related to having the ability to pace themselves. A seventh grade girl stated, "I tried harder on the mile because it is easy and more fun and I can pick my own pace."

The girls reported that they tried harder on the PACER because 1) there was no set stopping point and they wanted to beat their previous score, 2) it's easier to score in the HFZ and 3) you can't rest or walk.

No set stopping point and wanted to try to beat previous score. Of the girls who tried harder on the PACER, 57% reported that it was because there was no required stopping point and they were trying to beat a previous score. A seventh grader explained in the interview why she tried harder on the PACER, "When you run

the PACER you can go on forever, if you are practiced and breathe correctly. The PACER lasts forever, and the one-mile run you can stop when you are done.”

Easier to score in the HFZ. Of the girls who tried harder on the PACER, 34% reported that they did so because it was easier to score in the HFZ. One eighth grader responded, “I tried harder on the PACER because I made a goal to score in the healthy fitness zone and that goal was easier for me to obtain.”

Cannot rest or walk. Of the girls who tried harder on the PACER, 9% reported that it was because they could not rest or walk. An eighth grade female reported, “I tried harder on the PACER because you have to get there before the beeps and you can’t slow down.”

Six percent of the girls reported that they tried equally hard on both the one-mile run and the PACER. A ninth grade girl reported, “I think I really tried to do my best on both, because I really wanted to prove to myself that I could do both of them. I didn’t get in the healthy fitness zone, but I think I did pretty well for me.”

What Do You Like About the One-Mile Run?

Eight themes were used to categorize the girls’ responses concerning what they liked about the one-mile run: 1) choose your pace, 2) opportunity to exercise, 3) test is outside, 4) run with friends, 5) test is challenging, 6) easy to score in the HFZ, 7) only four laps, and 8) ability to compete with others.

Choose your pace. A number of girls (35%) really liked the fact that they could choose their own pace while running the mile. A ninth grade female responded by saying, “I like that we were able to pace ourselves and go at our own speed. I like the fact that everyone is not always together, because then I push myself to run with those ahead of me.”

Opportunity to exercise. A number of respondents (13%) enjoyed the one-mile run because they had the opportunity to exercise. A seventh grader noted, “It makes me feel good about myself and gives me the chance to exercise.”

The test is outside. Some girls (12%) liked to be outside while running the one-mile run. An eighth grade female mentioned in her interview, “I like to be outdoors more.”

Run with friends. A few girls (11%) reported that they enjoyed the one-mile run because they could be with their friends. One eighth grader summed it up by saying, “I like running or walking with my friends. You can walk and talk at the same time.”

The test is challenging. Girls (11%) reported that one thing they liked was the challenge of the test. One seventh grader reported, “I like the mile because you can try as hard as you can and challenge yourself.”

Easy to score in the HFZ. Nine percent of the girls reported that what they liked about the one-mile run was that it was easy to score in the HFZ. A seventh grade female stated, “I like that I can pretty much always score in my fitness zone.”

Only four laps. Girls (6%) appreciated that the one-mile run was only four laps and that they knew they could stop when they had completed all of the laps. One ninth grade female replied, “I like that you know what the finish line is and that you can count down. My mind set when I run is that I should run as fast as I can so I can get it over with sooner.”

Ability to compete with others. Three percent of the girls reported that they liked the one-mile run because they could compete with others. One ninth grade girl replied, “I like the fact that not everyone is always together, because then I push myself to pass those ahead of me.”

What Do You Dislike About the One-Mile Run?

Responses to this question were categorized into six themes: 1) test is physically challenging, 2) test is outside, 4) hate running, 5) test is boring, and 6) hate nothing about the one-mile run.

Test is physically challenging. Girls’ (72%) biggest dislike concerning the one-mile run was the physical challenge. In her interview, a seventh grade female summed up the feelings of many girls by saying, “The mile is really hard, and people are all in front of you and jogging past you...and it was getting really hard and I was feeling dizzy and sick.”

Test is outside. Eleven percent of girls disliked that the one-mile run was done outside. A female ninth grader wrote, “I don’t like that we have to run outside because the temperature affects how well I do.”

Hate running. A small group of girls (8%) disliked the one-mile run because they hate running. One ninth grade female commented, “I hate everything about the mile run. I don’t like running.”

Test is boring. Respondents (7%) disliked the one-mile run because they felt like it was boring. An eighth grade female responded, “It is very boring going around the track a bunch of times.”

Hate nothing about the one-mile run. Two percent of respondents loved running the one-mile run and reported that there was nothing they disliked about the test.

What Do You Like About the PACER Test?

Positive student comments concerning the PACER were broken down into five themes. The themes were 1) test procedures, 2) easy to score in the HFZ, 3) indoors, 4) run with friends, and 5) nothing.

Test procedures. This includes responses about the music, the beep, the rest time allowed if you got to the line early, the distance between the cones, the fact that the tape paced them, and that they can choose when to quit. The majority of the girls' (75%) responses fell under this theme. One eighth grade female wrote, "I like that it starts off slowly, so you don't feel pressure, and it is easy at first. It is fun to gradually get faster and faster and see how long you can go back and forth." A seventh grade female that was interviewed gave her insight on the PACER, "I like the fact that everyone goes together, because that way if I slow down they're helping me pace myself."

Easy to score in the HFZ. A number of girls (11%) reported that they liked the PACER because it was easy to score in the HFZ. A seventh grade female responded, "I like that it is pretty easy to score in the healthy fitness zone."

Indoors. Six percent of the girls enjoyed being inside. During the warm weather, a seventh grade female wrote, "I like that it is inside so that we can run and not get all sweaty."

Run with friends. A few girls (5%) reported that they liked the PACER because they could run with their friends. One ninth grade female explained, "I liked running it because I set a goal with my friend to get at least thirty laps. We ran together and encouraged each other the whole time."

Nothing. A small group of girls (3%) reported that there was nothing they liked about the PACER test. One eighth grader girl expressed her feelings by writing, "I really don't like anything about the PACER."

What Do You Dislike About the PACER Test?

Girls' responses about disliking the PACER were grouped into five themes: 1) test procedures, 2) indoors, 3) too competitive, 4), nothing, and 5) too crowded.

Test procedures. The majority of the girls (69%) reported that they disliked the test procedures associated with the PACER. A ninth grade female wrote, “You just run back and forth. You have to go at the tape’s pace. It gets faster and faster. The guy’s voice on the tape is weird. I hate being told how fast to run, it just makes me want to run slower.”

Indoors. Girls (10%) reported that they disliked that the PACER test was run indoors. An eighth grade female wrote, “I don’t like that it is indoors. It gets really hot and gross inside.”

Too competitive. Nine percent of respondents disliked the competitive nature of the test. One ninth grade girl reported, “I don’t like that everyone has to run together. You feel self-conscious when you fall behind.” An eighth grader responded, “I hate that everyone is watching you and can see your score.”

Nothing. A number of girls (7%) stated that there was nothing they did not like about the PACER. One seventh grade female reported, “There is nothing I don’t like about the PACER because I am good at it.”

Too crowded. Girls (5%) also reported that they disliked that the test area was so crowded when running the PACER. A ninth grade female shared her frustrations, “I disliked how big the groups were. We should have had more groups so we could have more space. I run well when I have more space.”

Discussion

Due to the declining PA rates of girls, it is important for them to have a positive experience in physical education classes, including fitness testing. Students who have a negative attitude towards fitness testing may be less likely to assess their progress as adults (Stewart, et al., 2005). Dennison et al. (1988) also reported there is some evidence suggesting childhood fitness testing results could predict adult PA levels.

One of the purposes of the FITNESSGRAM fitness test is to provide feedback to students and parents and to encourage students to adopt PA patterns that will lead to improved health and fitness (Ernst, et al., 2006). Keating and Silverman (2004) also agree that the purpose for fitness testing in the schools is to help students develop personalized fitness programs. It will be difficult to have a positive influence on students if they are not enjoying the fitness tests in which they are required to participate.

The results of this study can help educators better understand girls' perceptions and preferences of CV fitness testing. Physical educators can use the results of this study to create a positive environment as girls participate in fitness testing, working toward one of the ultimate goals of physical education, which is to produce physically active adults (Pangrazi & Corbin, 1993).

In this study, it was apparent that junior high school girls have an understanding of the purpose of fitness testing. The physical educator discussed the importance of CV fitness testing with the girls before administering the tests and girls demonstrated in their responses they understood this information. Thus, the physical educator may play a key role in helping students understand why they are participating in CV fitness testing.

Significantly more girls (62%) in this study preferred the PACER test to the mile run test. Yet still 38% of the girls preferred the mile run. An ideal physical education setting would allow junior high girls to choose for themselves in which test they would like to participate. Allowing girls to make this decision may motivate them to try harder on the test.

One study revealed that student effort while participating in the one-mile run was a concern, especially for girls (Vincent et al., 1999). Girls in the current study reported that they tried harder on the one-mile run when compared with the PACER test. Some found it hard to get into the HFZ on the mile run. Another reason girls may try harder on the one-mile run is because all students must complete all four laps. On the PACER test, girls choose when they would like to end the test. Differences between the studies may be explained by teacher perceptions versus student perceptions. Based on her observations of girls participating in the mile run, the teacher made a field note stating that it is possible that physical educators may inaccurately judge student effort while girls are participating in the one-mile run. Girls who walk the majority of the run might perceive they are giving their best effort, whereas the teacher may not have the same perception.

Six percent of girls reported that they tried the same on both tests. It is encouraging to know that some girls were giving their best effort on both tests, even though it was a small percentage of students. Ultimately, physical educators want to motivate girls to try their best on all activities in physical education. Understanding girls likes and dislikes toward CV fitness testing can assist physical education teachers in adjusting the tests to meet student preferences.

There were a number of reasons girls liked the one-mile run and PACER tests. It is interesting that the most common positive theme for the one-mile run was that participants can choose their own pace and the most common theme for the PACER was that girls liked the test procedures, specifically the fact that the speed increased slowly, or that the tape paced the participant. This clearly demonstrated that some girls like to dictate their own pace while others like the pace to be dictated for them. This indicates why the most effective way to assess CV fitness may be in allowing girls to choose in which test they would like to participate.

A number of girls' dislikes concerning CV fitness can be addressed in an attempt to better meet the preferences of the girls. Seventy two percent of the girls' negative comments about the one-mile run were because they found it physically challenging. Physical educators could adjust curricula and make sure they are properly preparing their girls for the challenge of participating in the one-mile run. Offering choice in fitness testing could make sure this challenge didn't translate into negative attitudes towards PA due to a feeling of coercion regarding test participation. Some girls mentioned that they often disliked running the one-mile run outside due to weather conditions. The teacher reported in a field note that she heard girls complaining about the weather to one another. Physical educators could make it a priority to only run the one-mile run on days that have temperate weather conditions.

One dislike concerning the PACER could be adjusted: the test is too crowded. Physical educators could make a conscious effort to have small groups when participating in the PACER test. This may take more time, but if the test is more enjoyable for the girls the time will have been well spent.

Junior high school girls may have a more positive CV fitness testing experience if they are given the opportunity to choose which test they would prefer to participate in. Xiang, McBride, and Solmon (2003) found students liked to have choices but teachers rarely allowed students choices in their own learning. Prusak, Treasure, Darst & Pangrazi (2004) confirm that an autonomy supportive environment appeals to student wishes to become independent, resulting in increased intrinsic motivation. Lonsdale, Sabiston, Raedeke, Ha, & Sum (2009) found that physical education class environments which provided student choice were related to greater PA. Therefore, the researchers in this study suggest that physical educators coordinate with one another and when possible allow girls

to choose which test they would prefer to participate in. Creating a positive experience in fitness testing for this age group may have a carry-over effect by increasing girls' PA levels, especially as they move into high school where girls' PA levels are low (U.S. Department of Health & Human Services, 2008).

Recommendations

The results of this study indicate that more girls preferred running the PACER to the mile run. Replications of this study are recommended to verify this finding. This study should be replicated with boys. There is also a need for further research to determine if having choices while participating in CV fitness tests increases PA outside of class.

Even though the results of this study showed most girls preferred running the PACER, there were still many girls who liked the mile run. Results from this study indicate that in order to improve student motivation to be physically active, it is in the best interest of the girls to allow them to choose in which test they would like to participate.

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