

## Teacher Perceptions of FITNESSGRAM® and Application of Results

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### ABSTRACT

*International Journal of Exercise Science 9(2): 187-204, 2016.* The purpose of this study was to examine perceptions of physical educators toward state-mandated use of FITNESSGRAM®. Two validated instruments were employed to collect data regarding teacher ( $n=174$ ) perceptions and use. Mean ( $M$ ) and standard deviations ( $SD$ ) were calculated for all scale scores with t-tests and ANOVAs testing for differences by selected demographics. Overall attitudes toward FITNESSGRAM® were slightly positive ( $M = 4.52$ ,  $SD = 1.06$ ) on a 7-point Likert scale. The demographic variable gender ( $p = 0.017$ ) was found to be statistically significant. In regards to the application of FITNESSGRAM® results, teachers more than frequently used the results ( $M = 5.51$ ,  $SD = 1.12$ ) on a 7-point Likert Scale. Class size ( $p = 0.015$ ) was found to influence their use. Teachers reported a positive attitude toward FITNESSGRAM® and indicated that the test administration was enjoyable. Most recommendations for use of results were adhered to except parental reporting.

KEY WORDS: Teacher perceptions, fitness testing, FITNESSGRAM®

### INTRODUCTION

In order to support the nation's fight against obesity, physical education teachers must assume a more prominent public health role due to the amount of time youth spend in school-based settings (2, 26, 39). One related responsibility shared by physical educators is to teach students to value physical activity and develop a knowledge/skill base that enables them to become lifelong movers who maintain health-enhancing levels of fitness (32). Field-based testing in physical education is the most common method for assessing

physical fitness levels in children (14, 40). The use of fitness testing in physical education is employed to (a) teach children about physical activity and health-related fitness, (b) motivate children to assume active lifestyles, and (c) monitor program effectiveness.

According to Corbin (5), one of the primary goals of this type of testing is to provide students with knowledge about health-related fitness so that they may become more physically active as adults. If students are to reach this important instructional goal, they must acquire

knowledge pertaining to the health-related fitness components and assessment helps to serve this purpose (32). This health-oriented approach to school fitness testing is reflected in recent modifications to the President's Challenge Program and Physical Fitness Test which have been administered in schools since the 1960s by the President's Council on Fitness, Sports, and Nutrition. The newly developed Presidential Youth Fitness Program focuses on student health rather than performance outcomes through use of the FITNESSGRAM® test protocol, supporting professional development for teachers, and positive reinforcement for participating students (31).

With fitness test administration representing a possible method for increasing physical activity and health-related fitness levels among youth, some states (i.e. West Virginia, California, Texas) have established policies that mandate periodic fitness testing within school physical education. In 2006, roughly 8% of states required fitness testing in schools (17). The percentage of states mandating fitness testing increased to roughly 24% in 2010 (33). With the intent of mediating West Virginia's growing obesity problem, House Bill 2816 was passed in 2005. One of the main components of this bill was the required implementation of annual fitness assessments in school physical education (13). In conjunction with this legislative initiative, the West Virginia Board of Education modified Policy 2520.6 mandating the annual administration of FITNESSGRAM® in grades 4-8 and high school physical education within all schools located in the 55 counties of West Virginia (12). This policy first took effect during the

2005-2006 school year. Prior to Policy 2520.6, the Presidential Physical Fitness Test was the required fitness assessment used across the state. The FITNESSGRAM® is a comprehensive, health-related fitness assessment that focuses on the following fitness categories: (a) aerobic capacity, (b) body composition, (c) abdominal strength and endurance, (d) trunk extensor strength and flexibility, (e) upper body strength and endurance, and (f) flexibility. Within these six categories, teachers have the options to select specific tests for each component of health-related fitness (28). After fitness testing, the data are forwarded to the West Virginia Department of Education (12). Those data are reported by school administrators as part of their Tenth Month Report at the end of each school year.

The rationale for mandated school-based fitness test administration in West Virginia and other states relates to a number of perceived benefits. Mahar and Rowe (24) argue that statewide fitness testing can lead to the further development and implementation of policies that increase the amount of time students engage in physical education and physical activity which could help to improve youth fitness levels. Fitness testing in physical education is also one of the most memorable physical education experiences for adults and, for this reason, a highly visible aspect of the school curriculum (14). The National Association for Sport and Physical Education (32) takes a definitive position in stating that "...fitness measurement can enhance teaching and learning in physical education" (p. 4). Fitness testing can also teach children about the importance of health-related physical fitness and be used as a motivational tool to increase physical

activity levels among school-aged children (40). The National Association for Sport and Physical Education (32) maintains that an assessment is a necessary component of knowledge acquisition regarding health-related fitness. In addition, Garn and Sun (10) suggest that students can take this knowledge and develop individualized fitness plans that allow them to record their personal accomplishments over time. However, even with those perceived benefits and strong advocacy for its continued use in physical education, a number of significant concerns persist.

Although many states have mandated fitness testing requirements for schools, there are numerous potential problems associated with this professional practice (29). The developers of both FITNESSGRAM® (28) and the President's Challenge Programs (34) do not recommend state required fitness testing for a variety of reasons, including the opportunity for misuse (i.e. fitness test results as a predictor of teacher effectiveness). Due to other factors such as heredity and maturation, researchers also argue that the contribution of fitness testing to the overall development of health-related fitness is probably minimal (23). Many researchers are skeptical about the long-term benefits of fitness testing on physical fitness due to the lack of supporting research (6, 19). This absence of consensus among professionals in the field is not necessarily a bad thing. According to Liu (22), "Only through such dialogues can we create much more interest in how we can appropriately conduct fitness tests and what else we can do about them" (p. 124). While the related advantages and disadvantages have been argued, there

remain three areas in which additional research could improve our understanding of fitness test use in schools: (a) teacher perceptions toward fitness testing, (b) teacher adherence to recommendations of best practice, and (c) teacher use of results for instructional purposes within the physical education curriculum.

An integral component of proper fitness test administration relates to teacher perceptions and attitudes (8). Numerous scholars have called for additional research on physical education teacher attitudes toward fitness testing, but these calls have mostly gone unanswered (8, 15, 18, 25). In a study conducted with California secondary physical education teachers, Ferguson et al. (8) found that teachers only had a somewhat positive attitude toward fitness testing and did not believe that the results from the FITNESSGRAM® were very useful. There has also been a scarcity of research examining specific contextual variables that influence teacher attitudes toward fitness testing. In their study, Ferguson et al. (8) determined that class size (<40) and grade level taught were both significant factors in influencing physical education teacher attitudes towards fitness testing. Another factor that could influence physical education teacher attitudes is engagement in continuing professional development opportunities related to fitness test administration. Teachers who have access to specific training in fitness testing are more inclined to conduct the assessment (30). Martin et al. (25) found that many teachers have voiced a need for appropriate professional development in this area. In order to improve mandated, institutional fitness testing, and

professional development this type of teacher feedback needs to be considered (5).

The manner in which fitness testing is administered can have a significant impact on the outcome and is also of concern. In order to be effective, fitness testing should be a fully integrated component of the overall physical education curriculum (24, 37). When fitness testing is administered one time throughout the school year to fulfill the district or state requirements, students become disinterested, which can lead to uninspired performances (42). Teachers should discuss the purpose of fitness testing and allow sufficient opportunities for students to practice the test (5, 37, 42). Other instructional strategies that enhance the quality of the educational experience for the student include testing students in small groups with similar fitness levels (32, 42), having a flexible testing schedule, and allowing students adequate time to warm-up (38).

There are numerous recommendations for teachers' use of fitness test data and results. Silverman et al. (37) indicate that fitness testing can be a beneficial method for teachers to self-assess their health-related instructional practices. Ernst, Corbin, Beighle, and Pangrazi (7) suggest that fitness testing should be used to assist in the planning of curriculum for physical education as well. Results from fitness testing should be kept confidential (5, 24, 32) and grades should never be assigned based on fitness test performance (9, 24). Data can also be used to compare fitness testing results with standardized test scores to determine the contribution of physical education and health-related fitness to academic achievement in the classroom (4).

Most of these recommendations, however, have not been adhered to and a disconnect remains between these guidelines for appropriate use of fitness test results and what is actually being practiced in schools (20). Keating and Silverman (20) found that the most frequent use of fitness test results was to either give the results to the student or teachers keep the results for themselves making no attempt at further dissemination. This approach does not reflect current recommendations for best practice that advocate using fitness test results to develop instruction and increase student learning. In total, however, there is limited research available regarding how teachers employ fitness test results to enhance their instructional effectiveness. The purpose of this study was to examine the perceptions of West Virginia physical education teachers toward the mandated use of the FITNESSGRAM® and to gain a better understanding of how the resultant data are employed to enhance physical education programming. We additionally hypothesized that physical education teachers' attitudes about FITNESSGRAM® could predict variance in their use of the FITNESSGRAM® after controlling for demographic variables.

## METHODS

### *Participants*

Participants within the study were physical education teachers identified within a listserv from the West Virginia Department of Education Office of Healthy Schools (N=839). Out of the 839 surveyed, 213 respondents initiated the survey (25.4%) and 174 provided usable responses (20.7%). Sample demographics are described in

**Table 1.** Description of participant demographics.

Demographic Category	Frequency ( <i>n</i> )	Percentage (%)
Gender		
Male	76	43.7
Female	98	56.3
Ethnicity		
Caucasian	167	97.1
African-American	1	0.6
Asian/Pacific	1	0.6
Islander	3	1.7
Other		
Professional Organization*	69	38.8
None	72	40.4
WVAHPERD	24	13.5
AAHPERD	6	3.4
Midwest-AAHPERD	11	6.2
NASPE	35	19.7
Other		
RESA		
I	18	10.3
II	21	12.1
III	22	12.6
IV	16	9.2
V	21	12.1
VI	12	6.9
VII	38	21.8
VIII	26	14.9
Certified PE Teacher		
No	7	4.0
Yes	167	96.0
Years of Teaching PE		
0-9	47	27.0
10-19	54	31.0
20+	73	42.0
Grade Levels Currently Teaching*	55	30.9
PreK-2	64	36.0
3-5	81	45.5
6-8	59	33.1
9-12		
Class size		
25 and Under	76	43.7
26-35	75	43.1
36 and Over	23	13.2
State Requirement for Fitness Testing	6	3.50
No	164	94.8
Yes	3	1.70
I Don't Know		
Formalized Fitness Testing Training	69	39.7
No	105	60.3
Yes		

Specifically, of the 174 survey completers, gender representation in the study was relatively even with 76 males (43.7%) and 98 females (56.3%) responding. Consistent with state demographics, most participants self-reported their race as Caucasian (*n*=167, 97.1%). Membership to professional organizations varied among participants with the majority citing membership in either the West Virginia Association for Health, Physical Education, Recreation and Dance (WVAHPERD; *n*=72, 40.4%) or no membership to any professional organization (*n*=69, 38.8%). Participants reported relatively equal representation from among the eight Regional Educational Service Agencies (RESAs) which provide resources and support for public school teachers within the state.

Researchers asked participants about their teaching certification, teaching experience, and use of FITNESSGRAM® that are also reported in the demographic table (see Table 1). Of particular note, the vast majority of the respondents cited being certified physical education teachers (*n*=167, 96%) with varying years of teaching experience (less than 10 years, *n*=47, 27%; between 10 and 19 years, *n*=54, 31%; and 20 years and over, *n*=73, 42%). Eighty-one participants selected middle school as a grade level currently taught (45.5%) followed by grades three through five at 64 (36%), high school at 59 (33.1%), and PreK-2 at 55 (30.9%). Within these varying grade levels, class size seemed to be manageable with 151 participants (86.8%) teaching an average class size under 35. The majority of participants knew there was a state requirement regarding the annual administration of the FITNESSGRAM® (*n*=164, 94.8%) and over half (*n*=105, 60.3%)

of the respondents reported receiving formalized training related to test administration and actual use of fitness testing within their classroom during the past three years.

#### *Protocol*

The employed survey instrument was the validated (16) Physical Education Teacher Attitudes toward Fitness Tests Scale (PETAFTS; 19). The overall alpha for the scale is 0.89, which indicates acceptable reliability (16). The survey instrument has been used to measure secondary physical education teacher perceptions toward fitness testing in California (8) along with pre-service physical education teacher attitudes (21).

Keating and Silverman (19) recommend using this instrument to investigate physical education teacher perceptions toward fitness testing. Since its development, the instrument has been cross-revalidated and modified which led to the deletion of one item (16).

The instrument contains nine personal information questions and 15 items measuring affective (10) and cognitive (5) components of attitudes with two subdomains in the affective (e.g., enjoyment of implementing fitness tests and enjoyment of using fitness test results) and one in the cognitive (e.g., beliefs about the usefulness of the test). Six of the items on the instrument are negatively worded to assist in the identification of unusable responses. The Likert scale ranges from 1 (strongly disagree) to 7 (strongly agree). A score of four indicates a neutral attitude. Demographic variables include gender, ethnicity, professional membership, years

of teaching, grade levels currently teaching, class size, and formalized fitness test administration training received. Eleven additional items were added to measure how the teachers are using fitness tests in their schools. These items were derived from those employed by Keating and Silverman (20) to determine physical education teachers' use of fitness tests. The instrument's alpha reliability was between 0.80 and 0.92 for each of the subdomains. A 7-point Likert scale was used ranging from 1 (never) to 7 (always). A score of four indicates sometimes.

Following Institutional Review Board (IRB) approval, the researcher recruited from an existing listserv of physical education teachers in West Virginia. The assistant director of the Office of Healthy Schools, West Virginia Department of Education granted access to this listserv. A total of 839 physical education teacher email addresses are included, and it is thought to be a complete list of physical education teachers employed within the state. Due to the relatively small size, the entire population was surveyed for this study. For the convenience and mass distribution, researchers used a web-based survey as previously described. Three rounds of a survey iteration were conducted with follow-up occurring at four and approximately five weeks after the initial survey distribution. The total time frame for respondents to participate in the survey was six weeks.

#### *Statistical Analysis*

Researchers compiled results from Survey Monkey™ and converted for use in the Statistical Package for the Social Sciences (version 19.0; Chicago, IL) for analysis. All

descriptive and inferential statistical analyzes were performed using SPSS. To address the primary research questions related to physical education teachers' perceptions and use of FITNESSGRAM®, means and standard deviations were calculated for all scale scores. Researchers calculated frequencies for all demographic variables. Secondary research questions related to the level of importance among demographic variables to the two scales of teacher attitude and use of the FITNESSGRAM® were addressed using t-tests and ANOVAs employing a general linear model ( $p < .05$ ). A series of linear regressions were run to answer the final research question of whether attitudes can predict variance in use of FITNESSGRAM® after controlling for demographic variables.

The attitude toward FITNESSGRAM® section of the survey included 15 items from a scale developed by researchers in a similar study (16). These items included questions about physical education teachers' enjoyment and usefulness of fitness testing for their students. Items included a 7-point Likert-type response scale from 1 (strongly disagree) to 7 (strongly agree). Six items were reverse coded and then averaged into a scale score. The scale score was assessed for both normality and internal reliability with this sample. To check normality of the scale scores, descriptive statistics, kurtosis, and skew were calculated. Mean, median, and mode were all similar, and kurtosis (-0.364) and skew (-0.165) all suggested normality was acceptable. Cronbach's alpha was used to measure internal consistency; with 174 participants, the attitude scale had excellent internal reliability (alpha = 0.92).

The use of fitness testing section of the survey included eleven items adapted from a previous study examining physical education teachers' use of fitness testing results (20). Items included questions about how physical education teachers use fitness testing results to improve their personal instruction. These items employed a similar 7-point Likert-type response scale from 1 (never) to 7 (always) which were then averaged into a scale score. This scale score was assessed for both internal reliability and normality within this sample. Researchers used Cronbach's alpha with 174 participants to measure internal consistency. The attitude scale had an adequate internal reliability (alpha = 0.84). To check the normality of the scale scores, descriptive statistics, kurtosis, and skew were calculated. Mean, median, and mode were all approximated, and kurtosis (-0.152) and skew (-0.480) suggested normality was acceptable.

## RESULTS

The individual item results for teacher attitudes toward FITNESSGRAM® can be seen in Table 2. Overall, participants had a slightly positive attitude toward FITNESSGRAM® ( $M = 4.52, SD = 1.06$ ). The item-level results indicate that teachers uniformly care about students' fitness test results ( $n=158, 91.3\%$ ). However, less agreement was evident when asked if it is fun when their students take fitness tests ( $n=71, 40.6\%$ ) and whether or not results of fitness tests motivate their students to participate in physical activity on a regular basis ( $n=64, 36.3\%$ ).

For negatively worded items, the results indicate that teachers have a common level

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**Table 2.** Individual Item Results: Attitudes toward FITNESSGRAM®

Items	N	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
1. I care about my students' fitness test results	173	1 (0.6%)	4 (2.3%)	2 (1.2%)	8 (4.6%)	31 (17.9%)	83 (48.0%)	44 (25.4%)
2. My students' fitness test results help me effectively evaluate my students' health-related fitness	176	3 (1.7%)	10 (5.7%)	20 (11.4%)	14 (8.0%)	51 (29.0%)	61 (34.7%)	17 (9.7%)
3. The results of fitness tests help my students understand their health-related fitness	176	1 (0.6%)	17 (9.7%)	14 (8.0%)	23 (13.1%)	56 (31.8%)	55 (31.3%)	10 (5.7%)
4. I enjoy watching my students taking fitness tests	176	6 (3.4%)	20 (11.4%)	9 (5.1%)	41 (23.3%)	42 (23.9%)	45 (25.6%)	13 (7.4%)
5. I enjoy implementing fitness tests in my classes	175	7 (4.0%)	21 (12.0%)	18 (10.3%)	27 (15.4%)	37 (21.1%)	54 (30.9%)	11 (6.3%)
6. I feel like time flies when my students are taking fitness tests	178	14 (7.9%)	24 (13.5%)	25 (14.0%)	28 (15.7%)	39 (21.9%)	39 (21.9%)	9 (5.1%)
7. The results of fitness tests can be used to assess the effects of my physical activity/fitness instruction	175	13 (7.4%)	32 (18.3%)	18 (10.3%)	22 (12.6%)	41 (23.4%)	37 (21.1%)	12 (6.9%)
8. I feel it is fun when my students take fitness tests	175	11 (6.3%)	33 (18.9%)	25 (14.3%)	35 (20.0%)	41 (23.4%)	26 (14.9%)	4 (2.3%)
9. The results of fitness tests motivate my students to participate in physical activity on a regular basis	176	14 (8.0%)	44 (25.0%)	24 (13.6%)	30 (17.0%)	38 (21.6%)	21 (11.9%)	5 (2.8%)
10. I ignore the results of my students' fitness tests	175	36 (20.6%)	86 (49.1%)	19 (10.9%)	22 (12.6%)	7 (4.0%)	5 (2.9%)	0 (0.0%)
11. The results of my students' fitness tests are useless	178	28 (15.7%)	62 (34.8%)	31 (17.4%)	16 (9.0%)	30 (16.9%)	8 (4.5%)	3 (1.7%)
12. I dislike using the results of my students' health-related fitness	176	17 (9.7%)	60 (34.1%)	28 (15.9%)	40 (22.7%)	20 (11.4%)	10 (5.7%)	1 (0.6%)
13. I dislike spending my teaching time on implementing fitness tests	177	8 (4.5%)	60 (33.9%)	26 (14.7%)	35 (19.8%)	26 (14.7%)	18 (10.2%)	4 (2.3%)
14. The results of fitness tests inaccurately reflect what students learned from my physical activity/fitness instruction	174	6 (3.4%)	28 (16.1%)	17 (9.8%)	29 (16.7%)	37 (21.3%)	42 (24.1%)	15 (8.6%)
15. My students seem to ignore their fitness test results	177	10 (5.6%)	20 (11.3%)	23 (13.0%)	18 (10.2%)	50 (28.2%)	41 (23.2%)	15 (8.5%)

*Note.* Adopted from "Physical Education Teacher Attitudes toward Fitness Tests Scale: Cross-revalidation and Modification," by X. D. Keating, J. Guan, R. H. Ferguson, L. Chen, and D. M. Bridges, 2008, *Measurement in Physical Education and Exercise Science*, 12, p. 75. Copyright 2008 by the Taylor and Francis Group.

of disagreement to ignoring the results of students' fitness tests ( $n=141$ , 80.6%). General disagreements were also apparent related to the results of students' fitness tests being useless ( $n=121$ , 67.9%), a dislike

of utilizing the results ( $n=105$ , 59.7%), and a dislike spending instructional time on implementing fitness tests ( $n=94$ , 53.1%). Little disagreement was reported in regards to the results of fitness testing inaccurately

reflecting student learning from teachers physical activity/fitness instruction ( $n=51, 29.3\%$ ) and students ignoring their fitness test results ( $n=53, 29.9\%$ ).

When examining results based on specific demographics (Table 3), individual variables were found to have a significant effect on the overall perception of the population. In reference to gender, males ( $M = 4.75, SD = 1.03$ ) had a more positive attitude regarding FITNESSGRAM® than their female counterparts ( $M = 4.36, SD = 1.05$ ) ( $t(171) = 2.41, p = 0.017$ ). While statistically not significant, but approaching significance, veteran teachers with over 20 years of teaching experience in physical education had a more positive attitude ( $M = 4.68, SD = 1.14$ ) than novice teachers who have spent less than ten years teaching in physical education ( $M = 4.25, SD = 0.94; F(2,172) = 2.44, p = 0.09$ ). Group differences with respect to class size ( $p = 0.768$ ) and formalized fitness test administration training ( $p = 0.357$ ), were not found to be statistically different.

Individual item results can be found in Table 4. Overall, physical education teachers deem the results of FITNESSGRAM® somewhat useful ( $M = 5.51, SD = 1.12$ ). Specifically, the item-level results indicate that teachers almost always keep the results of their students' fitness tests ( $n=165, 95.9\%$ ). The most common reasons for holding the results were to track students' progress on the tests ( $n=131, 77\%$ ) and to encourage regular physical activity participation ( $n=129, 74.9\%$ ). Teachers also

**Table 3.** Group Differences regarding FITNESSGRAM® Attitude and Use

Variable	Group	M	SD	p-value
Overall Attitude	Gender			0.017*
	Male	4.75	1.03	
	Female	4.36	1.05	
	Years of teaching			0.090**
	0-9	4.25	0.94	
	10-19	4.57	1.00	
	20+	4.68	1.14	
	Class size			0.768
	Small class (25 and under)	4.56	0.98	
	Large class (25 and over)	4.51	1.12	
	Formalized training			0.357
	No	4.44	1.08	
Yes	4.59	1.04		
Overall Use	Grade levels taught***			
	3-5	4.53	1.02	
	6-8	4.57	1.12	
	9-12	4.51	0.96	
	Gender			0.538
	Male	4.56	1.07	
	Female	4.46	1.15	
	Years of teaching			0.111
	0-9	4.29	1.07	
	10-19	4.41	1.18	
	20+	4.70	1.08	
	Class size			0.015*
Small class (25 and under)	4.74	0.95		
Large class (26 and over)	4.33	1.20		
Formalized training			0.267	
No	4.39	1.22		
Yes	4.58	1.04		
Grade Levels Taught***				
3-5	4.72	0.94		
6-8	4.42	1.12		
9-12	4.42	1.23		

\*Indicates statistically significant difference between groups ( $p < .05$ ); \*\*Borderline statistically significant difference between groups ( $p < .05$ ); \*\*\*No group comparisons were made using this multiple response survey item.

# FITNESSGRAM® PERCEPTIONS

**Table 4.** Individual Item Results: Use of FITNESSGRAM®

Items	N	Never	Rarely	Occasionally	Sometimes	Frequently	Usually	Always
1. I keep the results of my students fitness tests	172	2 (1.2%)	1 (0.6%)	1 (0.6%)	3 (1.7%)	7 (4.1%)	19 (11.0%)	139 (80.8%)
2. I keep the results of my students' fitness tests so that I can track students' progress on the tests	170	11 (6.5%)	5 (2.9%)	8 (4.7%)	15 (8.8%)	13 (7.6%)	43 (25.3%)	75 (44.1%)
3. I use the results of my students' fitness tests to encourage them to participate in physical activity on a regular basis	172	3 (1.7%)	5 (2.9%)	10 (5.8%)	25 (14.5%)	30 (17.4%)	41 (23.8%)	58 (33.7%)
4. I keep the results of my students' fitness tests as references to improve my future physical activity/fitness instruction	170	11 (6.5%)	8 (4.7%)	15 (8.8%)	29 (17.1%)	25 (14.7%)	37 (21.8%)	45 (26.5%)
5. I give my students a report of their performance on fitness tests	173	15 (8.7%)	12 (6.9%)	11 (6.4%)	27 (15.6%)	20 (11.6%)	38 (22.0%)	50 (28.9%)
6. I keep the results of my students' fitness tests so that students can track their progress on fitness tests	171	17 (9.9%)	14 (8.2%)	6 (3.5%)	25 (14.6%)	14 (8.2%)	43 (25.1%)	52 (30.4%)
7. I use the fitness test results to help students set up their future fitness goals	172	16 (9.3%)	17 (9.9%)	9 (5.2%)	44 (25.6%)	26 (15.1%)	34 (19.8%)	26 (15.1%)
8. I develop better physical activity/fitness lesson plans using my students' fitness test results	172	13 (7.6%)	20 (11.6%)	22 (12.8%)	32 (18.6%)	24 (14.0%)	39 (22.7%)	22 (12.8%)
9. I report the results of my students' fitness tests to the students' parents	172	39 (22.7%)	42 (24.4%)	11 (6.4%)	26 (15.1%)	12 (7.0%)	19 (11.0%)	23 (13.4%)
10. My students' grades were partly based on their fitness test results	171	98 (57.3%)	24 (14.0%)	5 (2.9%)	11 (6.4%)	8 (4.7%)	12 (7.0%)	13 (7.6%)
11. My principal uses the results of my students' fitness tests to evaluate my physical activity/fitness instruction	171	98 (57.3%)	24 (14.0%)	13 (7.6%)	16 (9.4%)	4 (2.3%)	9 (5.3%)	7 (4.1%)

*Note.* Adopted from "Teachers' Use of Fitness Tests in School-Based Physical Education Programs," by X. D. Keating and S. Silverman, 2004, *Measurement in Physical Education and Exercise Science*, 8(3), p. 157. Copyright 2004 by the Lawrence Erlbaum Associates, Inc.

reported giving the results to students so that they can track their own fitness progress ( $n=109$ , 63.7%), using the results as a reference to improve their physical activity/fitness instruction ( $n=107$ , 63%),

and also giving their students a report of their performance on fitness tests ( $n=108$ , 62.5%). Finally, teachers are less inclined to report the results to parents ( $n=54$ , 31.4%),

base students' grades off of these findings ( $n=33, 19.3\%$ ), and individual building administrators utilizing the results to evaluate teachers' physical activity/fitness instruction ( $n=20, 11.7\%$ ).

Only one variable was found to have a significant influence on teacher application and use of FITNESSGRAM® results (Table 3). Average class size had a significant influence on the application of FITNESSGRAM® results ( $t(171) = 2.451, p = 0.015$ ). Teachers seemed to be more favorable using FITNESSGRAM® results with smaller classes (25 students and under;  $M = 4.74, SD = 0.95$ ) than those who reported having large classes (more than 25 students;  $M = 4.33, SD = 1.20$ ). Gender ( $p = 0.538$ ), years of teaching physical education ( $p = 0.111$ , and formalized fitness training ( $p = 0.267$ ) were found to be statistically not significant.

Both demographic variables ( $F(4, 172) = 3.125, p = 0.0016$ ) and demographics with the inclusion of attitudes ( $F(5, 172) = 324.51, p < 0.0001$ ) could be used to predict variance in FITNESSGRAM® use (Table 5). Consistent with our hypothesis, attitudes about FITNESSGRAM® significantly predicted variance in FITNESSGRAM® use even after controlling for number of years teaching, class size, formal training, and gender ( $\Delta R^2 = 0.354, p < 0.0001$ ); for every unit change in attitudes about FITNESSGRAM® there was a corresponding 0.62 unit change in use.

**DISCUSSION**

The primary purpose of this study was to examine West Virginia physical education teacher perceptions of the mandated use of

the FITNESSGRAM® and to gain a more complete understanding of how the resultant data are employed to enhance physical education within the schools. There are several findings that merit the attention of policymakers in West Virginia and possibly other states with similar mandates. This discussion section examines (a) the overall teacher perceptions and use of fitness testing, (b) the influence of demographic variables and contextual factors, (c) the practical implications of the findings, and (d) the limitations and future directions for this line of research.

**Table 5.** Regression Results Predicting Use of FITNESSGRAM Results, N = 173

	<u>Step 1: Covariates</u>			<u>Step 2: Full model</u>		
F	3.125			24.51		
df	4			5		
p-value	0.016			<0.0001		
R <sup>2</sup>	0.069			0.423		
ΔF	--			102.49		
ΔR <sup>2</sup>	--			0.354		
Δp-value	--			<0.0001		

  

<u>Predictors</u>	<u>B (se)</u>	<u>Beta</u>	<u>t-value</u>	<u>B (se)</u>	<u>Beta</u>	<u>t-value</u>
Constant	4.516 (0.50)	--	9.02***	1.578 (0.49)	--	3.22**
Years teaching	0.235 (0.10)	0.172	2.29*	0.074 (0.08)	0.054	0.90
Class size	-0.301 (0.12)	-0.187	-2.45*	-0.285 (0.10)	-0.177	-2.94**
Training	0.218 (0.17)	0.096	1.28	0.132 (0.14)	0.058	0.98
Gender	-0.229 (0.17)	-0.102	-1.33	0.058 (0.14)	0.026	0.41
Attitude	--	--	--	0.651 (0.06)	0.618	10.12***

\*p-value < 0.05, \*\*p-value<0.01, \*\*\*p-value<0.0001

Overall, West Virginia physical education teachers reported a slightly positive attitude toward the FITNESSGRAM®. These findings are similar to previous studies examining preservice physical education teacher attitudes toward fitness testing (21) and secondary physical educator's attitudes toward the FITNESSGRAM® (8). A closer examination of the results indicates that teachers somewhat enjoy the fitness testing process. Counter to the recommendation from Cale and Harris (3) that more time should be spent on the promotion of physical activity instead of fitness testing, participants within this study reported a positive level of enjoyment as it relates to the fitness testing process and indicated that, for the most part, the testing process is relatively smooth. This finding is encouraging to the extent that research has shown that teacher perceptions and behaviors are closely related (1). One could assume that physical educators favor the FITNESSGRAM® mandate and effort is given to ensure a quality fitness testing process within individual programs. However, even with the favorable attitudes reported among the participants with regards to FITNESSGRAM® administration, the more pressing issue is whether or not physical educators find value in their use of fitness testing results. As opposed to previous findings (8) where teachers reported a lack of usefulness in FITNESSGRAM® results, teachers in the current study found merit there.

While the outcomes of this study indicate favorable attitudes toward administration of the FITNESSGRAM® and usefulness of the results, it is imperative to examine the extent to which teachers are correctly

applying these results to their individual physical education programs. Up to this point, there has been little research (20) examining how physical education teachers employ fitness test results for instructional purposes. In the current study, the findings indicate that teachers in West Virginia are adhering to most of the specific applications of FITNESSGRAM® results recommended in the literature.

As mentioned previously, the most common uses of FITNESSGRAM® is for teachers to either keep the results for themselves or provide them to students (20). In the current study, high frequencies of both uses were reported. Two of the reasons cited for keeping the test results directly involved student use: (a) goal setting and (b) tracking student progress. Mahar and Rowe (24) believe that fitness testing provides students with a baseline score that will allow them to evaluate their progress over the course of a year or several years. While teachers alluded to keeping the results so students can track their progress, fewer frequent uses were found in reference to helping students develop future fitness goals. This lack of review or discussion could explain why students often find limited use for their personal fitness test results.

Four of the items on the instrument specifically examine how teachers use FITNESSGRAM® results: (a) track student progress, (b) encourage physical activity participation, (c) reference to improve future physical activity/fitness instruction, and (d) develop better physical activity/fitness lesson plans. The two most cited uses in the current study were to track student progress and encourage physical

activity participation. Silverman et al. (37) recommends that teachers use FITNESSGRAM® results in order to self-assess their fitness instructional methods. This recommendation is somewhat being followed with teachers mostly using the results as a future reference to improving instruction and to a lesser extent develop better physical activity lesson plans.

For the most part, the recommendations from the literature in regards to appropriate use are being followed by physical education teachers in West Virginia. However, there remains one primary area of concern: parental reporting. With parental support enhancing physical activity participation in youth (41), it is concerning that teachers cited only occasionally reporting the results to students' parents. With the ease of generating reports and emailing them to parents through the FITNESSGRAM® software this finding is troublesome.

The following sections describe the impact specific demographic variables and contextual factors such as gender, years of teaching physical education, class size, grade levels taught, and formalized fitness testing training have on physical education teacher perceptions and application of results of the FITNESSGRAM®.

In a previous study examining pre-service teacher perceptions toward fitness testing, Keating et al. (21) found that gender did not have a significant influence on teacher attitudes. However, similar to results published by Ferguson et al. (8) males have a significantly more positive attitude toward fitness testing than their female counterparts. At this point, it is unclear as

to why these differences exist. In regards to the application of FITNESSGRAM® results, gender was not found to have a significant influence.

Contrary to findings published by Ferguson et al. (8), years of teaching experience in physical education, while not statistically significant, had a borderline influence on attitudes toward fitness testing. In the current study, the level of positive attitude toward the FITNESSGRAM® increased as teachers progressed throughout their careers. This increase could be beneficial if veteran physical education teachers are willing to serve as mentors to novice teachers in order to increase positive attitudes toward fitness testing (37). One could attribute these attitude differences to a lack of preparation within PETE programs. Physical education teachers seem to apply results more frequently as they progress throughout their careers. While no other study has examined this area, this could indicate a need for PETE programs to prepare pre-service teachers for applying fitness test results to their physical activity and fitness instruction.

Large class size is usually a common occurrence in physical education and research has cited the difficulties associated with these types of classes (i.e. 27, 11). Some teachers have cited that smaller class sizes would improve the overall quality of fitness test administration (5). In their study, Ferguson et al. (8) found that class size had a significant influence on teacher attitudes toward fitness testing. In the current study, teacher attitudes were not influenced by the number of students in their respective classes. However, class size did have a significant influence on the

frequency of use of FITNESSGRAM® results by physical education teachers. Physical education teachers, who reported an average class size of less than 25 students, were more likely to apply results to their professional practice than those with larger class sizes. If physical education teachers are expected to add FITNESSGRAM® results to their physical activity/fitness instruction, class size equivalent to other subject areas is an area in need of consideration.

There have been questions about the effect professional development has on changing teaching behaviors (35) within the literature. Recently, physical education teachers have cited appropriate fitness test administration training as a need to enhance the experience (25). However, in the current study, results indicate that this factor was not significant in determining teacher perception and use of FITNESSGRAM® results.

Consistent with the slightly favorable attitudes and general use of FITNESSGRAM® results, positive attitudes about and reported use of FITNESSGRAM® results were strongly associated with each other. Our results suggest that attitudes about the FITNESSGRAM® was more strongly predictive of using the FITNESSGRAM® results than any other measured demographic characteristic, including formalized training, teach gender, class size, and teaching experience. In order to improve use of the FITNESSGRAM®, policy-makers and interventionists may wish to additionally develop positive attitudes about the FITNESSGRAM®.

The results of this study provide a description of how teachers perceive the FITNESSGRAM® and apply the results to improve their instruction. From these outcomes there are three important areas that need to be considered moving forward: (a) continuation of the state mandate, (b) the role of PETE programs to improve fitness testing, and (c) parental reporting.

Creators of the FITNESSGRAM® do not recommend mandated fitness testing (28), however the number of states requiring the administration of fitness tests is increasing. One of the main reasons to examine physical education teachers' perceptions toward FITNESSGRAM® was to gain a better understanding of how the mandate was being received. Corbin (5) recommends considering teacher feedback in order to improve the fitness testing process. The results of the current study indicate that physical education teachers in West Virginia find value in the FITNESSGRAM® and for the most part are following the majority of recommendations from the research related to appropriate application of results. This finding is encouraging in that physical education teachers deem these results meaningful and modify their instructional practices in order to serve the needs of their respective students. For this reason, while state-wide mandated fitness testing goes against some recommendations, its value as a method to assist in the fight against childhood obesity is warranted.

The primary role of PETE programs is to prepare pre-service physical education teachers for entry into the physical education profession. Fitness testing remains one of the most publicly visible

issues in the physical education teaching profession. The results of this study indicate that veteran teachers have a more positive attitude toward fitness testing than novice teachers. While one could assume that teacher educators dedicate time during pre-service teacher preparation teaching to fitness test administration, this alone is not sufficient. One approach to better prepare pre-service teachers would be to familiarize them with the FITNESSGRAM® software. Another approach could be to require the actual administration of test items during early field experiences. This approach would allow pre-service teachers the opportunity to collect the results in PK-12 environments and generate physical education lessons focusing on physical activity/fitness.

The recommendations from the literature with regards to parental reporting and the relative lack of adherence have already been addressed (7). While the reasons for this are unknown at this point, there are certain measures that school administrators can implement at the state level that could increase the level of parental reporting. The FITNESSGRAM® software can generate prescriptive feedback reports with specific instructions on how to improve fitness scores and engage in a more active lifestyle (28). First, similar to the policy that requires individual schools to submit their results to the WV Department of Education this policy could also require schools to provide parents with a copy of the report. However, it is undetermined what version of this software (if any) is currently being utilized across the state. With FITNESSGRAM® 10.0 software, teachers can generate these reports electronically. If a previous version of the software is all that

is available, reports could be printed off and included in the student's report card.

Researchers employed an internet based survey method for the data collection. While the target response rate was reached (20% target, 25.4% actual) and is consistent with other published response rates (36), this low response rate hinders generalizability of the results to the entire population or populations within other states. Another related issue is the inability to follow-up with participants in order to gain a better understanding of the reasons behind response selections.

While this study provides a description of attitudes toward FITNESSGRAM® and how teachers perceive the usefulness of the results, there are remaining research questions requiring further investigation. In order to gain a better understanding of these areas, a follow-up study using a qualitative approach would enable the research team to identify specific reasons for the responses. This proposed study could pinpoint specific influences that have an effect on how teachers perceive the overall mandate and find merit in the results. By identifying these influences, professional development could be modified in order to better assist teachers in creating a quality fitness testing experience and provide concrete examples or ideas to increase the likelihood of the results be utilized to improve physical activity/fitness instruction.

Another area that researchers need to investigate is the methods implemented across PETE programs regarding the preparation of pre-service teachers to administer the FITNESSGRAM® and create

lessons that address the physical activity/fitness needs of students. With this study providing a description of teacher attitudes and application procedures being implemented across the state, PETE programs can formulate appropriate instructional practices for use within respective programs. One final area that needs investigation is student use of FITNESSGRAM® results. Up to this point, the majority of focus, while limited, has investigated student perceptions toward fitness testing. However, there is a paucity of research concerning how the results influence future physical activity participation among pupils. With the primary goal of FITNESSGRAM® focusing on influencing physical activity participation (7, 37, 42). If this goal is not being achieved, one will have to question the continuation of fitness testing in school-based physical education settings.

With physical education teachers reporting a slightly positive attitude toward state-mandated FITNESSGRAM® administration and a majority of the recommendations from the literature being adhered to, in its present state, mandated fitness testing seems to have considerable warrant for its continuation in the future. However, without follow-up investigations and the identification of meaningful methods of applying the results, issues may occur that devalues its role in influencing physical activity/fitness participation.

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