

**INTERNATIONAL JOURNAL OF
INNOVATIVE RESEARCH AND KNOWLEDGE**

ISSN-2213-1356

www.ijirk.com

**Beyond Talking the Talk: How Fit are Health and Physical
Education Majors?**

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Abstract

As additional burdens are placed on the teacher preparation student and the novice physical education teacher there will be a need to improve capacity for physical activity and fitness for carrying out the duties of a teacher (Perrotta, 2006; Wilkinson, 2018). Teacher education students may be required to demonstrate improved dispositions and skills for teaching (Perrotta, 2006). While also improving their skills performance (Webster, 2017), and general fitness behaviors (Hunt et al., 2017). A failure of teachers to be able to model behavior and demonstrate a general level of fitness may contribute to their being disregarded by students as role models or authorities. Undergraduates at Arkansas Tech University (Russellville, AR) participating in the Health and Physical Education Teacher Education (HPE) program of study are required to enroll in Methods of Teaching Fitness and Wellness Concepts (PE3051). Students develop the understanding that physical fitness is associated with a variety of health benefits in young people (Ortega, Ruiz, Castillo, & Sjostrom, 2008), and it is considered one of the most important health status markers that predict cardiovascular disease and risk of mortality (Erwin et al., 2013). Utilizing FITNESSGRAM, the health related physical fitness levels are assessed in the areas of body composition, muscle strength, muscle endurance, flexibility, and cardiorespiratory endurance. These five areas have been assessed each Spring Semester starting in Spring Semester 2014 and continuing through Spring Semester 2017. The target criterion for level of fitness, as determined by the Society of Health and Physical

Educators (SHAPE America), was used to evaluate student results. The purpose of this study is to determine if undergraduate physical education teacher education majors are capable of meeting the requirements for increasing levels of health physical activity behaviors.

Beyond Talking the Talk: How Fit are Arkansas Tech University HPE Majors?

The population in the United States is experiencing higher Body Mass Index (BMI) values which are indicative of a greater risk of disease and poor health (Centers for Disease Control, 2017). Current trends in physical activity and diet have resulted in the sedentary lifestyle being identified as a health hazard and a contributing factor for coronary heart disease (Pate et al., 1995; Cavallini, et al., 2007; Xiaoxia, et al., 2018). While less than half of adults engage in physical activity three times a week (USDHHS, 2005) our current culture of sedentary lifestyle is spreading from the adult population to children and youth. The increasingly sedentary lifestyle may have contributed to the rate of obesity in children tripling between 1980 and 2002 (USDHHS, 2005) and will almost certainly have negative repercussions in the future. Despite a firmly understood role that physical activity plays in developing healthy children and youth, only 23% of children meet the goal of 60 minutes of physical activity each day (Xiaoxia, et al., 2018).

The predominant responsibility for improving student fitness in the K12 arena has traditionally fallen on physical education teachers because of their preparation (Sallis & McKenzie, 1991), their curriculum (Webster, 2017), and their personal representation of a physically active lifestyle (Hunt et al., 2017). Social Cognitive Theory maintains the position that a portion of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions (Bandura, 1986). While it is well established what the necessary skills are for promoting physical activity, the traditional Physical Education Teacher Education (PETE) program has failed to adopt practices that would instruct future educators in the application of such skills to unfit populations (Xiaoxia, et al., 2018). With the publication of the 2017 National Initial PETE Standards and the emphasis on "physically literate" individuals, there is a greater need for preservice physical educators to master the knowledge, skills, and dispositions aligned promoting a healthy lifestyle.

Participants

Participants for this study were students majoring in Health and Physical Education (Teacher Education and Coaching Emphasis) who self-selected enrollment in Methods of Teaching Fitness and Wellness Concepts (PE3051). To be eligible to participate in this course students had to have a declared major of Health and Physical Education – Teaching Coaching. A sample of 249 students (176 males and 73 females) participated in this study. Students were randomly assigned to participate in this study in the sense that students self-selected which semester they would participate in the course. The number of students enrolled in the course each semester varied according to the total number of students in the teacher education program.

Methods

Each Fall Semester students in Health and Physical Education participate in advising and registration for courses during the following Spring Semester. Enrollment in courses is influenced by course prerequisites, class size, course availability (whether it is offered), and student adherence to course progressions. Each individual participating in the HPE program is required to take PE3051 prior to placement in their Internship Year (Student Teaching Clinical Practice). To satisfactorily complete the course, students must obtain a grade average of 70% or better on a 100 point scale by fulfillment of required learning activities and assessments stipulated in the course syllabus.

Students in Health and Physical Education enrolled in PE3051 are required to participate in the FITNESSGRAM battery of tests consisting of the following test items: PACER test, Abdominal Curl-up, Push-up, Back Saver Sit and Reach, and Body Mass Index (BMI). Students are informed of their need to undertake these activities through the course description, in the course syllabus provided to each student and available online or through BlackBoard, during the course orientation on the first day of class, and periodically throughout the course. Students selecting not to participate in the activities are given an opportunity to resign from the course and enroll in subsequent semesters (Spring Semesters only).

Insofar as PE3051 is a part of a pedagogy program, attention to test protocol established by test designers is rigorously adhered to. Students engage in reading the FitnessGram test, setting up simulated and actual test areas, performing test items with strict attention to protocol, conducting the testing process, collecting data from test sessions, and interpreting test data. Descriptions of each of the test items can be found in Table 1.

The protocol for conducting the test, collecting data, and interpreting results from students has been established by the Cooper Institute (retrieved from <http://www.cooperinstitute.org/fitnessgram>) and is widely reported (Welk, Going, Morrow, Meredith, 2011). In general, students were introduced to the test items one at a time. For each test item, there was practice for the participants in executing the test and in conducting the data collection aspect of testing for the examiner. Students practiced both aspects of the testing process several times before their scores were recorded for this study.

At each practice session, the students were presented and reviewed the protocol they were to follow. Questions or concerns were answered. Students were organized for conducting the particular test item with all of the necessary supplies and equipment set out for them. Each test was conducted with attention to protocol, correctness of student performance, and accuracy of data collection. Informed about the termination criteria for the specific test, students performed the test item until they met the criteria for stopping.

Results

Participants for this study were 249 undergraduate students enrolled in the Health and Physical Education Teacher Education program of study while attending Arkansas Tech University during the Spring Semesters of 2014 through 2017. Results of the testing process are presented by participant gender (Table 2) and by semester (Table 3).

Spring 2014

During the Spring Semester of 2014, there were 59 students enrolled in PE3051 following the period of time during which courses can be dropped or students can be added. Following testing 29 students passed all five subtests, 13 students passed four of the five subtests, and 11 students passed three of the five subtests. A total of 89.8 percent of students passed three or more of the five subtests which meets the FitnessGram criteria for passing indicating these students have an overall satisfactory level of fitness.

Spring 2015

In the Spring Semester of 2015, there were 59 students enrolled in PE3051 following the period of time during which courses can be dropped or students can be added. Following testing 9 students passed all five subtests, 32 students passed four of the five subtests, and 13 students passed three of the five subtests. A total of 91.5 percent of students passed three or more of the five subtests which meets the FitnessGram criteria for passing indicating these students have an overall satisfactory level of fitness.

Spring 2016

During the Spring Semester of 2016, there were 20 students enrolled in PE3051 following the period of time during which courses can be dropped or students can be added. Following testing seven students passed all five subtests, five students passed four of the five subtests, and seven students passed three of the five subtests. A total of 95 percent of students passed three or more of the five subtests which meets the FitnessGram criteria for passing indicating these students have an overall satisfactory level of fitness.

Spring 2017

In the Spring Semester of 2017, there were 19 students enrolled in PE3051 following the period of time during which courses can be dropped or students can be added. Following testing eight students passed all five subtests, three students passed four of the five subtests, and five students passed three of the five subtests. A total of 84.2 percent of students passed three or more of the five subtests which meets the FitnessGram criteria for passing indicating these students have an overall satisfactory level of fitness.

Discussion

Arkansas Tech University Health and Physical Education preservice students demonstrate their understanding of the importance of being physically fit and healthy from a professional standpoint and from a personal perspective. This appreciation of fitness is developed during their teacher preparation program students by engagement in skill, practical, and theory-based courses. While each course is established in compliance with national standards and best professional practices, there is enough flexibility in course presentation that faculty can tailor the presentation and practice course content to meet the specific learning needs of students.

Within the Health and Physical Education program students are predominantly engaged in developing an understanding of how the practical and theoretical intertwine to create developmentally appropriate learning experiences for K12 students. Within skill classes in the program, students demonstrate their ability to teach the organization of learning experiences, conduct skills testing, and apply pedagogy skills. Traditionally this degree program has not emphasized student fitness levels as a part of their program beyond assessing fitness and letting students know where they stand relative to personal fitness levels.

Recent changes to national standards by the Society for Health and Physical Education (SHAPE, 2018) encourage the adoption of a minimum criteria for physical fitness levels in preservice teacher candidates. Passing three of the five, ideally five of the five, items on the FitnessGram are recommended guidelines for satisfactory completion of teacher preparation programs. While some universities have adopted the approach of “no pass – no teach”, most universities do not have a consequence associated with student performance on FitnessGram.

A crucial question for program administrators is what to do in the face of students not meeting requirements for FitnessGram. ATU established a requirement for students to pass three of the five tests prior to completing their student teaching experience. By a considerable margin students met the requirement to pass three tests with the PACER being the test most students would fail. When students failed a test item they were required to retest on the failed items several weeks later. While some would pass another test item, almost universally on the second administration the PACER would remain the test people did not pass. At this point the question became what to do to remediate students to promote better wellness. Because the testing was taking place during the student teaching experience there was little time and few options for faculty to address student performance. The question became whether or not to prevent students from completing their degree because they did not have a level of fitness that our professional organization deemed requirement for success.

Moving forward with new standards, HPE faculty are again addressing the question of how to promote student fitness without eliminating individuals with the potential to be successful teachers. One approach that is being considered is to apply the “knowledge, skills, and dispositions” model to include FitnessGram performance. Rather than requiring students to develop and maintain a perfect score on their FitnessGram, this approach views all tests scores within the context of achieving a balance between their Knowledge, Skills, and Dispositions. An average student in the classroom might demonstrate such exceptional skills, techniques, and dispositions that they compensate for a lower knowledge score. Similarly, high knowledge and disposition scores might be enough to compensate for mediocre physical skills. On closer examination it may be that the physical performance skills of different games and activities are strong enough that the average performance on FitnessGram is more than compensated for. The point of the perspective is that the student is an individual demonstrating balance in their professional development whose strengths and weaknesses complement each other to the point that they perform at a professional level of competence in the combination of knowledge, skills, and dispositions.

Teaching is a profession in which individuals attempt to promote acquisition and maintenance of behaviors society has indicated it values (e.g., Reading writing, mathematics, physical competence, etc.). Part of this process of skill acquisition can be explained in terms of the Social Cognitive Theory (Bandura, 1986). Because students learn to value and replicate behaviors they observe in those with whom they socially interact, it can be said that teachers must become that role model for students to emulate. Proponents of this perspective argue in favor of teachers with the greatest possible skill and fitness levels, as well, as attitudes and dispositions toward physical activity.

The incidental learning that takes place during interactions between teacher and student may shape the values that mediate the degree to which students make use of newly acquired skills. Abandoning skills and activities learned in physical education classes can contribute to the adoption of sedentary lifestyles. Adopting recreation practices that do not require at least moderate physical activity contributes to decreased fitness levels and increases in the negative physical, cognitive, or social attributes that place individuals at increased risk for illness. The degree to which students form ideas about physical activity based on teacher behaviors (explicit or implicit behaviors) can be said to argue in favor of more active and fit teachers.

Classroom teachers can fill a supportive role when they model a physically active lifestyle and infuse nutrition and physical activity into their portion of the school day (Cavallini et al., 2007). By providing feedback, mentoring, and encouragement classroom teachers can exert a positive influence on children and youth regarding the need for a health body to house the developing mind.

Many recommendations have been offered to address issues of obesity and sedentary lifestyles in children and youth; one program that is intended to address some of these issues is the Comprehensive School Physical Activity Program (CSPAP). This model of programming is believed to be able to develop in children the practices and beliefs needed to participate in healthy physical activity for the lifespan (Carson et al., 2014; Erwin et al., 2013). In the CSPAP model, physical education is identified as the hub, or focal point, for a physical activity program before, during, and after school. CSPAP should include activity, instruction, staff involvement, and opportunities for families to be involved (Xiaoxia, et al., 2018).

Further modifications of the PETE National Standards include a call for physical educators and pre-service physical educators to develop leadership skills (Xiaoxia, et al., 2018) appropriate for designing and leading physical activity beyond the traditional physical education class. CSPAP is designed to address the need for leaders of physical activity before school, after school, during recess, during lunch, and for classroom physical activity breaks (Carson, 2012; Webster et al., 2015). This developing role for physical educators will require them

to be in contact with community members to establish more access to physical activity. In addition to being responsible for teaching, physical educators will be called upon to build cooperative networks with administrators, teachers, parents, and the local community to promote physical activity programs for children and youth (Xiaoxia, et al., 2018). Finally, physical educators will use a variety of assessments available through Apps and online to promote student engagement and motivation. Physical education teachers may also be needed to market and promote the new program and student accomplishments, goals, and efforts.

With these changing responsibilities it is important that the PETE student is better acquainted with technology, team building, communication, goal setting, exercise promotion, and physical activity program design (Xiaoxia, et al., 2018). Five recommendations directly related to better preparing physical education teachers include: (1) model driven PETE preparation, (2) curriculum modification, (3) internship restructuring, (4) collaboration with cooperating teachers, and CSPAP training and certification with the PETE program.

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Acknowledgements

Special thanks to the Arkansas Tech University Computer Services Department for helping with the data collection.

Table 1: FitnessGram Test Items (The Connecticut Physical Fitness Assessment Test Administrator's Manual)**Cardiorespiratory Endurance – PACER**

Healthy levels of aerobic capacity are associated with reduced risk of high blood pressure, coronary heart disease, obesity, diabetes, some forms of cancer, and other health problems in adults. The P.A.C.E.R. (Progressive Aerobic Cardiovascular Endurance Run) (PACER) is a multi-stage aerobic fitness test that provides a built-in warm-up and helps children pace themselves effectively. The objective of the test is to run as long as possible back and forth across a 20-meter space at a specified pace that gets faster each minute. Emphasis should be placed on developing the fastest pace that can be sustained for the full distance covered. The first time the student does not reach the line by the beep, the student stops where he/she is and reverses direction immediately, attempting to get back on pace. The test is completed for a student the next time (second time) he/she fails to reach the line by the beep. The two corrections do not have to be consecutive; the test is over after two total corrections. A lap is one 20-meter distance (from one end to the other). The scorer records the lap number by crossing off the corresponding lap number on the PACER score sheet. The recorded score is the total number of laps completed by the student.

Back Saver Sit and Reach

The assessment is conceptually similar to the more traditional Sit-and-Reach test but is intended to be safer on the back by restricting flexion somewhat. Testing one leg at a time, students sit with one knee bent (with that foot flat on the floor) and one leg straight, with the foot of the straight leg against the box. The student then reaches forward with both hands to the farthest point he/she can reach on the measuring scale. After one side has been measured, the student switches the position of the legs and reaches again. The student may allow the bent knee to move to the side as the body moves forward if necessary, but the sole of the foot must remain on the floor. Record the number of inches on each side to the nearest half-inch reached, to a maximum of 12 inches. To achieve the Health Fitness Zone, the student must meet the standards on both the right and left sides.

Muscular Strength and Endurance

Balanced, healthy functioning of the musculoskeletal system requires that muscles be able to exert force or torque (measured as strength), resist fatigue (measured as muscular endurance), and move freely through a full range of motion (measured as flexibility).

Push-Up Test

The most important advantages are that it requires no equipment and very few zero scores occur. The use of a cadence with the push-up has been found to eliminate many of the concerns about all-out speed tests. The test begins in the up position. The test administrator starts the cadence and signals the students to begin. Students may continue until they wish to stop or have made two form errors. Students begin performing push-ups according to the cadence. The correct push-up is performed to a pace of one complete push-up every three seconds (1.5 seconds down and 1.5 seconds up, with no hesitation). Push-ups are continuous, with the muscles in a constant state of contraction and no resting. Emphasis is placed on the arm and shoulder muscles remaining engaged throughout the assessment. Record the total number of correctly performed push-ups. One complete push-up begins and ends in the up, or straight-arm, position. The test is terminated when the student has any two corrections.

Curl-Up Test

The use of a cadence (20 reps per minute) with the curl-up has been found to eliminate many of the concerns about the ballistic nature of one-minute all-out speed tests. The use of a pace helps to avoid early fatigue based on starting too fast, standardizes the movement from person to person, and makes it easier to judge whether a full proper repetition has been completed. The student assumes the starting position. The test administrator starts the cadence and signals the student to begin. Keeping heels in contact with the mat, the student is to curl up slowly, sliding fingers across the measuring strip until fingers reach the other side. Then the student uncurls until the head crinkles the paper on the mat. Movement should be slow and gauged to the audible cadence of 20 curl-ups per minute, or one curl-up every three seconds. The score is the total number of correctly performed curl-ups within the time limit. A curl-up is complete each time the student’s head returns to the mat. The test is terminated when the student has performed any two corrections.

Table 2: Participant FitnessGram Values

		Mean	SD	% in HFZ*
Aerobic Capacity	Male	37.98	9.76	22.78
	Female	33.59	7.07	27.54
		Mean	SD	% in HFZ*
Curl Up	Male	52.02	21.20	93.51
	Female	50.34	23.47	90.41
		Mean	SD	% in HFZ*
Push Up	Male	25.29	8.92	87.43
	Female	18.08	9.91	87.32
		Mean	SD	% in HFZ*
Percent Body Fat	Male	18.62	7.92	66.67
	Female	24.51	8.36	79.31
		Mean	SD	% in HFZ*
BMI	Male	28.38	6.03	22.58
	Female	25.78	5.46	45.21
		Mean	SD	% in HFZ*

Table 3: FitnessGram Performance Collapsed Across Genders by Semester

Year	Percent Body Fat	PACER	Push-Ups	Sit and Reach Right	Sit and Reach Left	Curl-ups
2015	M=19.51 SD=8.26	M=48.39 SD=17.11	M=24 SD=8.56	M=10.85 SD=1.40	M=10.79 SD=1.42	M=57 SD=21.55
2016	M=23.4 SD=9.01	M=51.22 SD=20.28	M=23 SD=8.48	M=11.35 SD=1.32	M=11.31 SD=1.26	M=50 SD=22.05
2017	M=18.69 SD=7.42	M=43.21 SD=22.06	M=23 SD=9.83	M=10.08 SD=2.70	M=9.91 SD=2.72	M=64 SD=18.68
2018	M=21.87 SD=8.76	M=40.01 SD=27.59	M=23 SD=10.71	M=11.27 SD=1.64	M=11.00 SD=1.96	M=44 SD=20.28